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AD45 and AE40 SERIES II UNDERGROUND ARTICULATED TRUCKS

Maintenance Intervals

Excerpted from Operation & Maintenance Manual ((SEBU7326-01)

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i01907748

Maintenance Interval Schedule

SMCS Code: 1000; 7000

Note: All safety information, warnings, and instructions must be read and understood before you perform any operation of any maintenance procedure.

Note: Before each consecutive interval is performed, all of the maintenance requirements from the previous intervals must be performed.

When Required

Battery - Recycle 102
Battery, Battery Cable or Battery Disconnect Switch - Replace 103
Brake Oil Cooler Screen - Clean 105
Circuit Breakers - Reset 112
Engine Air Filter Secondary Element - Replace .. 128
Exhaust Purifier - Inspect/Clean 135
Fuel System - Prime 137
Fuses - Replace 141
Hoist, Torque Converter and Brake Tank Breather - Replace 144
Oil Filter - Inspect 146
Radiator Core - Clean 149
Steering Tank Screen - Clean 162
Torque Converter Sump Screen - Clean 166
Window Washer Bottle - Fill 171
Window Wiper - Inspect/Replace 172

Every 10 Service Hours or Daily

Automatic Lubrication Grease Tank - Fill 100
Automatic Lubrication Grease Tank - Fill 100
Backup Alarm - Test 101
Belts - Inspect/Adjust/Replace 103
Body Pivot Bearings - Lubricate 104
Braking System - Test 107
Cooling System Level - Check 118
Ejector Cylinder Bearing - Lubricate 125
Engine Air Filter Primary Element - Clean/Replace 126
Engine Air Precleaner - Clean 128
Engine Oil Level - Check 130
Fire Suppression System - Check 135
Fuel Tank Water and Sediment - Drain 141
Hoist Cylinder Bearings - Lubricate 142
Hoist, Torque Converter and Brake Oil Level - Check 144
Indicators and Gauges - Test 146
Oscillating Hitch - Lubricate 147
Seat Belt - Inspect 150
Service Inspection 151
Steering Cylinder Bearings - Lubricate 159
Steering System Oil Level - Check 162
Suspension and Suspension Cylinder Bearings - Lubricate 163
Tailgate and Tailgate Cylinder Bearings - Lubricate 164
Transmission Oil Level - Check 170
Window - Clean 171

Every 50 Service Hours or Weekly

Automatic Lubrication Filler Filter - Clean 100
Cab Air Filter - Clean/Replace 110
Fuel System Water Separator - Drain 140
Tire Inflation - Check 164

Initial 250 Service Hours (or at first oil change)

Engine Valve Lash - Check/Adjust 133
Oscillating Hitch - Adjust 147

Every 250 Service Hours or Monthly

Automatic Brake Application System (Low Transmission Oil Pressure) - Test 99
Automatic Lubrication Inline Filter - Clean 101
Battery Electrolyte Level - Check 102
Cab Tilt Pin and Lockdown Pin - Check/Lubricate 111
Cooling System Coolant Additive (DEAC) - Add .. 115
Differential and Final Drive Oil Level - Check 123
Drive Shaft Universal Joints, Splines and Bearings - Inspect/Lubricate 124
Engine Oil and Filter - Change 130
Engine Shutdown to Idle Protection System - Test 132
Fan Drive Bearing and Belt Tightener - Lubricate 135
Frame and Body - Inspect 135
Fuel System Primary Filter - Clean/Replace 138
Fuel System Secondary Filter - Replace 139
Steering Stop - Check 159
Suspension Cylinder - Check 163
Wheel Bolt Torque - Check 171

Every 500 Service Hours or 3 Months

Brake Oil Filter - Replace 106
Engine Crankcase Breather - Clean 129
Fuel Tank Cap and Strainer - Clean 140
Parking Brake Release Oil Filter - Replace 148
Steering System Oil Filter - Replace 161
Torque Converter Oil Filter - Replace 165
Transmission Oil Filter - Replace 169

Every 1000 Service Hours or 6 Months

Brake Accumulator - Check 105
Ejector Line Screen - Inspect/Clean 125
Frame and Body Support Pads - Clean/Inspect .. 137
Hoist, Torque Converter and Brake Oil - Change 142
Hoist, Torque Converter and Brake Tank Screen - Clean 145
Oscillating Hitch - Adjust 147

Rollover Protective Structure (ROPS) and Falling Object Protective Structure (FOPS) - Inspect ... 149
Steering System Oil - Change 159
Transmission Breather - Clean 167
Transmission Magnetic Screen - Clean 167
Transmission Oil - Change 168

Every 2000 Service Hours or 1 Year

Differential Thrust Pin Clearance - Check 120
Differential and Final Drive Oil - Change 121
Engine Mounts - Inspect 129
Engine Valve Rotators - Inspect 134
Turbocharger - Inspect 170

Every 3000 Service Hours or 2 Years

Cooling System Coolant (DEAC) - Change 113
Cooling System Coolant Extender (ELC) - Add .. 117
Cooling System Pressure Cap - Clean/Replace .. 119
Engine Valve Lash - Check/Adjust 133

Every 3 Years

Seat Belt - Replace 151

Every 6000 Service Hours or 4 Years

Cooling System Coolant (ELC) - Change 114
Cooling System Water Temperature Regulator - Replace 119
Engine Water Pump - Inspect 134

i01869573

Automatic Brake Application System (Low Transmission Oil Pressure) - Test

SMCS Code: 4284-081

Certain Caterpillar machines may be equipped with an optional Automatic Brake Application (ABA) system.

The ABA system warns the operator of an impending brake application (low transmission oil pressure) and applies the parking brake if the pressure further decreases, e.g. engine stalled.

If your machine is equipped with the optional ABA system, perform the following test to check that the system is functioning correctly.

Note: Before testing the operation of the Automatic Brake Application (ABA) system, test the holding ability of the machine parking brake.

Reference: For more information on testing the parking brake holding ability, refer to the Operation and Maintenance Manual, “Braking System - Test” for the machine that is being serviced.

1. Be sure the area around the machine is clear of personnel and obstructions.

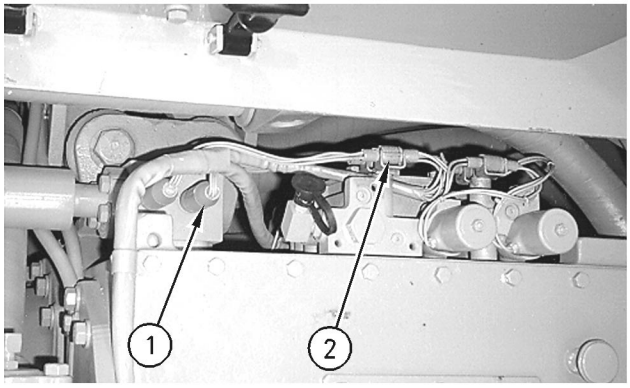

Illustration 170 g00952087

(1) Transmission oil pressure switch for brake application
(2) Connector

2. Disconnect transmission oil pressure switch (1) from the transmission wiring harness at connector (2).

Note: The correct transmission oil pressure switch can be identified by the EL331 blue wire and the EL330 grey wire in the transmission wiring harness that is connected to the switch.

3. Remove switch (1) from the manifold on the transmission. Install a **9S-4191** Plug (9/16-18 straight thread, O-ring type) in the manifold where the switch was removed. Reconnect the switch to the transmission wiring harness at connector (2).

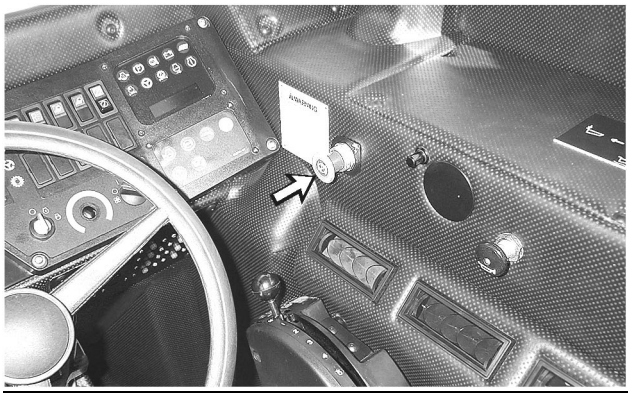

Illustration 171 g00940746

4. Move the transmission control to the NEUTRAL position. Start the engine.

5. Disengage the parking brake by moving the parking brake control to the OFF position.

6. Move the transmission direction and speed control to the FIRST SPEED FORWARD position.

7. Gradually increase the engine speed to 1300 rpm. The parking brake should remain engaged and the machine should not move.

Note: The parking brake indicator and the action lamp should flash and the action alarm should sound.

8. Reduce the engine speed to low idle, move the transmission direction and speed control to the NEUTRAL position. Engage the parking brake.

NOTICE

If the parking brake disengaged and the machine moved while testing the Automatic Brake Application (ABA) system, have the system inspected and repaired immediately before returning the machine to operation. Contact your Caterpillar dealer or refer to the Braking Section of the machine Service Manual.

9. Remove the plug and install transmission oil pressure switch for brake application (1) in the transmission manifold. Connect the switch to the harness at connector (2).

i01872259

Automatic Lubrication Filler Filter - Clean (Hydraulic Type)

SMCS Code: 7540-070-HR

Illustration 172 g00953579

Clean the filler filter (if equipped) every 50 service hours or weekly.

Reference: For information on cleaning the automatic lubrication system filler filter, refer to Systems Operation, Testing and Adjusting, “Automatic Lubrication System, Hydraulic Type” for the machine that is being serviced.

i01872085

Automatic Lubrication Grease Tank - Fill (Hydraulic Type)

SMCS Code: 7540-544-HR

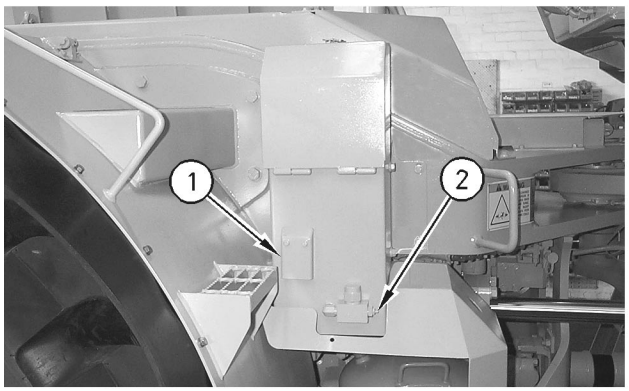

Illustration 173 g00953529

Note: The lubricant tank (if equipped) should be refilled at regular intervals. Refills should be performed daily to prevent emptying the system.

1. Use a manual lubricant gun or pump to fill the reservoir through filler fitting (2) in the pump body. Fill the reservoir until lubricant appears at overflow relief valve (1).
2. Check all lubricant lines for leakage.
3. Check hydraulic lines for leakage. Check for worn or damaged houses.
4. Check all lubricant injectors are operative. Check all bearings that are lubricated by the automatic lubrication system for signs of lubrication.
5. Inspect the electrical system for worn or frayed wiring, damaged connectors or a tripped circuit breaker.

Reference: For more information on the automatic lubrication system, refer to Systems Operation, Testing and Adjusting, “Automatic Lubrication System, Hydraulic Type” for the machine that is being serviced.

i01872083

Automatic Lubrication Grease Tank - Fill (Electric Type)

SMCS Code: 7540-544-HR

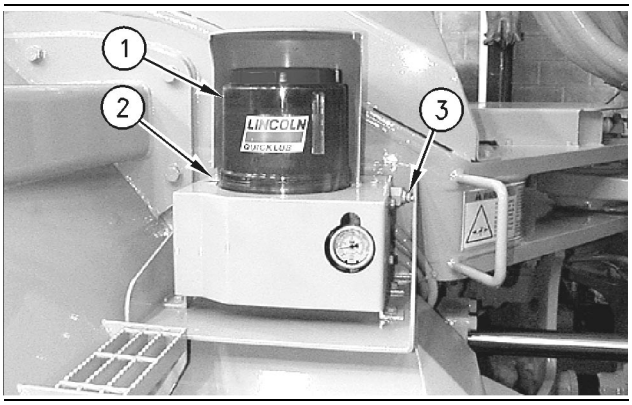

Illustration 174 g00953494

1. Check the grease level in the reservoir. Use a manual grease gun or grease pump to fill the reservoir through filler fitting (3) in the pump body.
2. Fill the reservoir to MAXIMUM indicator (1).

NOTICE
When filling the reservoir, caution should be used as extreme pressure and overfilling can cause damage to the reservoir assembly.

3. With the battery disconnect switch and the engine start switch in the ON position, trigger a lubrication cycle by pressing switch (2) on the side of the cover assembly.

4. Observe the stirring paddle in the lubricant reservoir. When the pump is operating, the stirring paddle should be rotating.

5. Check all discharge lines for leakage.

6. Check all injectors are operative. Check all bearings that are lubricated by the automatic lubrication system for signs of greasing.

7. Inspect the electrical system or worn frayed wiring, damaged connectors or a tripped circuit breaker.

Note: For more information on the automatic lubrication system, refer to Systems Operation, Testing and Adjusting, “Automatic Lubrication System, Electric Type” for the machine that is being serviced.

i01872267

Automatic Lubrication Inline Filter - Clean (Hydraulic Type)

SMCS Code: 7540-070-HR

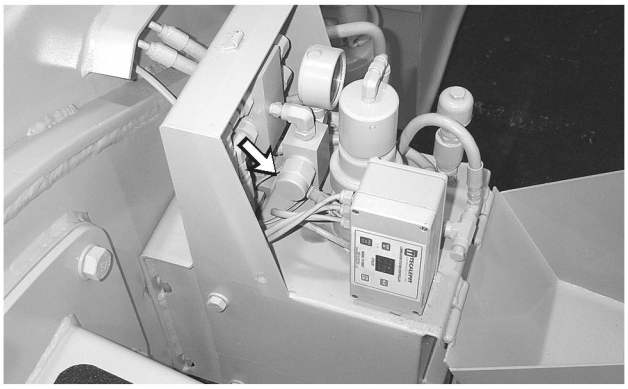

Illustration 175 g00953599

Clean the inline filter (if equipped) every 250 service hours or monthly.

Reference: For information on cleaning the automatic lubrication system inline filter, refer to Systems Operation, Testing and Adjusting, “Automatic Lubrication System, Hydraulic Type” for the machine that is being serviced.

i01855693

Backup Alarm - Test

SMCS Code: 7406-081

Make sure that the parking brake is engaged.

Turn the engine start switch to the ON position to perform the test.

Make sure that the area behind the machine is clear of personnel and clear of obstacles.

Apply the service brake. Move the transmission direction and speed control to the REVERSE position.

The backup alarm should start to sound immediately. The backup alarm should continue to sound until the transmission direction and speed control is moved to the NEUTRAL position or to the FORWARD position.

Illustration 176 g00946518

Rear view of AD45

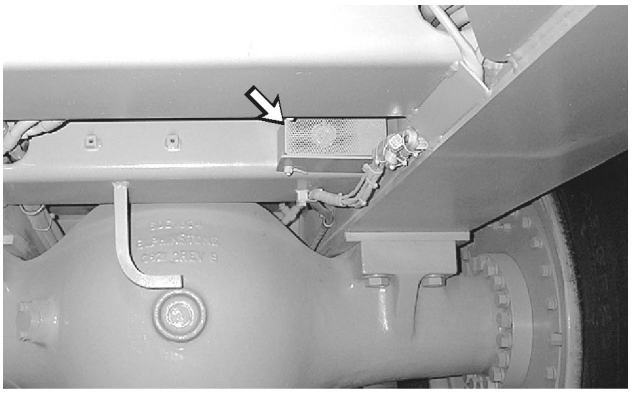

Illustration 177 g00946519

Rear view of AE40 Series II

The backup alarm is located at the rear of the machine.

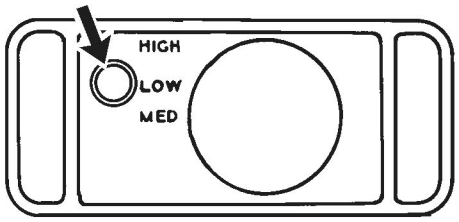

Illustration 178 g00896957

To adjust the sound level, turn the adjustment knob that is on the back of the alarm. The backup alarm is set at the highest sound level when the machine is shipped from the factory. The adjustment knob should remain at the HIGH position unless the job site requires a lower sound level.

i01765195

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier.
- An authorized battery collection facility.
- Recycling facility.

i01856935

Battery Electrolyte Level - Check

SMCS Code: 1401-535-ESG

Table 13

Battery Electrolyte Level	
Battery	**Interval**
Conventional	100 Hours
Low Maintenance	250 Hours
Maintenance Free	No Interval

Tighten the battery retainers on all of the batteries. Tighten the battery retainers at every 1000 hours.

Check the following areas at a minimum interval of 1000 hours. Check the following areas more frequently during adverse conditions.

Illustration 179 g00946649

1. The batteries are located under the cab. Tilt the cab to access the batteries.

   Reference: For information on tilting the cab, refer to the Operation and Maintenance Manual, “Cab - Tilt” for the machine that is being serviced.

Illustration 180 g00946657

2. Clean the battery surface with a clean cloth.
3. Disconnect all battery cables from the batteries.

   Reference: To disconnect the battery cables, refer to the Operation and Maintenance Manual, “Battery, Battery Cable or Battery Disconnect Switch - Replace” for the machine that is being serviced.

4. Clean the battery cables and the battery posts. Coat the battery posts with 1P-0808 Multipurpose Grease or petroleum jelly.
5. Connect the battery cables to the batteries.

Reference: To connect the battery cables, refer to the Operation and Maintenance Manual, “Battery, Battery Cable or Battery Disconnect Switch - Replace” for the machine that is being serviced.

6. Coat the terminals with **1P-0808** Multipurpose Grease or petroleum jelly. Then, install the post cover.

7. For conventional batteries and batteries of low maintenance, follow these additional instructions:

   - Inspect the battery electrolyte level in each battery cell. A maintenance free battery does not require inspection.
   - Maintain the level of the distilled water to the bottom of the filler openings. If distilled water is not available, use clean drinking water.
   - A battery should not require more than 30 cc (1.8306 in^3 (1 ounce)) of water per cell per week. This requirement should exist with the proper charging rate and with a moderate climate.
   - In extreme temperatures, check the water in the cells weekly. Cell water usage could be higher in extreme temperatures.

i01856382

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 1411-510

Reference: For information on tilting the cab, refer to Operation and Maintenance Manual, “Cab - Tilt” for the machine that is being serviced.

1. The batteries are located under the cab. Tilt the cab to access the batteries.

2. Turn the engine start switch to the OFF position. Turn all switches to the OFF position.

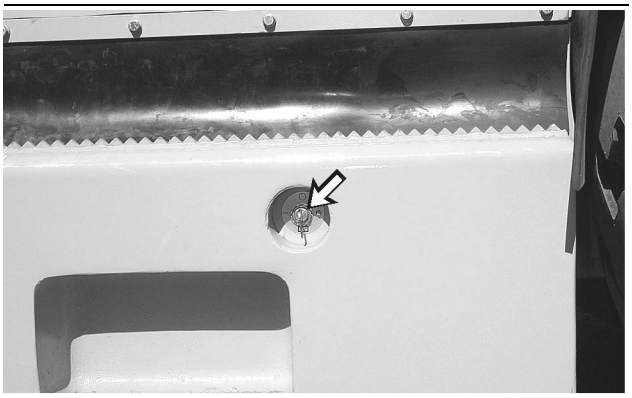

Illustration 181 g00946530

3. Turn the battery disconnect switch to the OFF position and remove the key.

4. Disconnect the negative end (-) of the battery cable from the electric starting motor.

5. Disconnect the negative end (-) of the battery cable from the battery.

6. Disconnect the positive end (+) of the battery cable from the battery

7. Replace the battery or make all necessary repairs to the battery.

8. Connect the positive end (+) of the battery cable to the battery.

9. Connect the negative end (-) of the battery cable to the battery.

10. Connect the negative end (-) of the battery cable to the electric starting motor.

11. Install the key. Turn the battery disconnect switch to the ON position.

i01876860

Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510

For maximum engine performance and utilization of your engine, inspect the belts for wear and for cracking. Check and adjust the belt tension to minimize belt slippage which will decrease belt life and cause poor performance of the alternator and any driven equipment.

1. Inspect the condition of the belts.

2. If a belt is worn or is damaged, replace the belt.

3. Inspect the tension of the alternator belt and air conditioning compressor belts.

4. Check the belt tightener for wear/alignment and that it is maintaining correct belt tension.

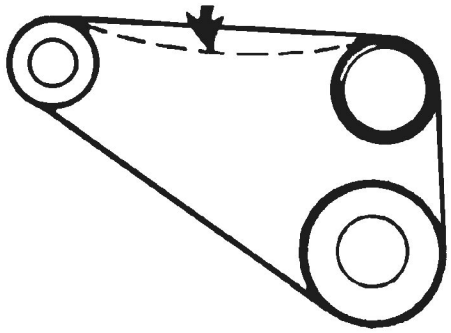

Illustration 182 g00954945

To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 17 ± 3 mm (0.67 ± 0.12 inch).

If new belt(s) are installed, check belt adjustment again, after 30 minutes of operation. For multiple belt drive applications, always replace belts in matched sets.

If only one belt of a matched set is replaced, it will carry more of a load than the belts not replaced since the older belts are stretched. The additional load on the new belt could cause it to break.

Adjust the Alternator Belt

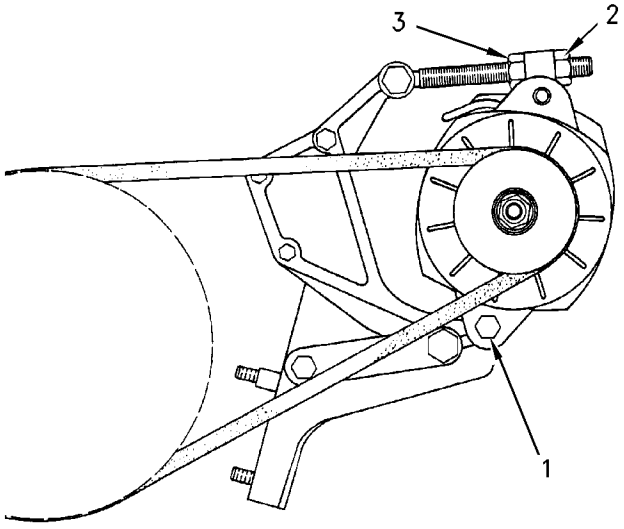

Illustration 183 g00954948

1. Loosen two mounting bolts (1) and locknut (2).

2. Turn adjusting nut (3) to obtain the correct adjustment.

3. Tighten the locknut and mounting bolts.

4. Check the belt deflection. If the amount of deflection is incorrect, repeat Steps 1 to 3.

Adjust the Air Conditioning Compressor Belt

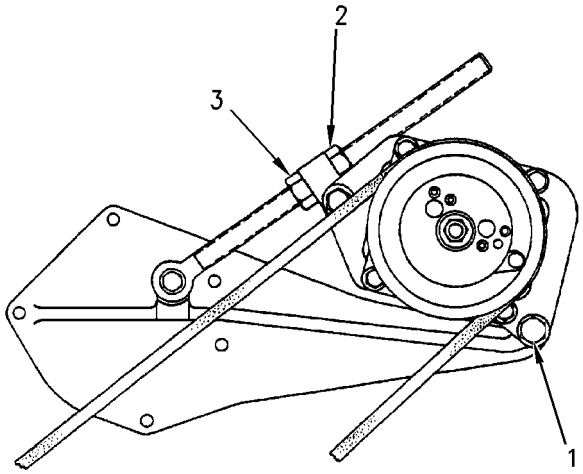

Illustration 184 g00954950

1. Loosen two mounting bolts (1) and locknut (2).

2. Turn adjusting nut (3) to obtain the correct adjustment.

3. Tighten the locknut and the mounting bolts.

4. Check the belt deflection. If the amount of deflection is incorrect, repeat Steps 1 to 3.

i01857128

Body Pivot Bearings - Lubricate

SMCS Code: 7258-086-BD

NOTICE
Check that the lines attached to all remote grease fittings are undamaged. If the lines are split, grease will not reach the bearings or pins. Machine damage will result.

Wipe all fittings clean before lubricating.

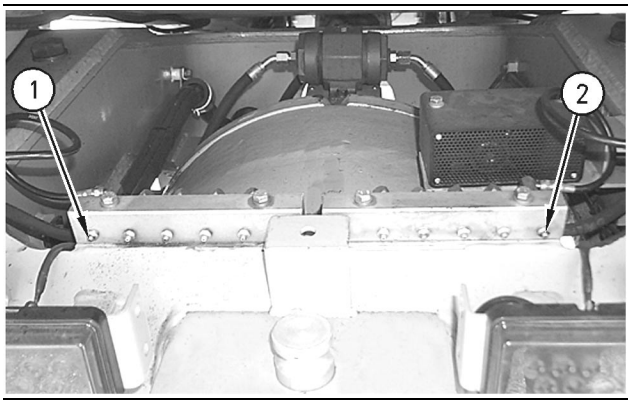

Illustration 185 g00946696

Rear view of AD45 machine

1. Lubricate the left body pivot bearing through remote mounted fitting (1).

2. Lubricate the right body pivot bearing through remote mounted fitting (2).

i01857165

Brake Accumulator - Check

SMCS Code: 4263-535

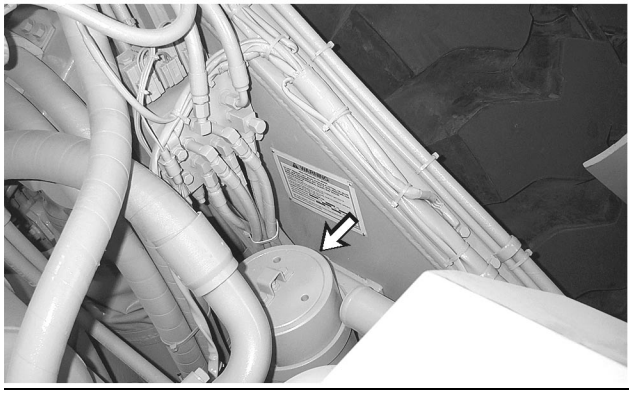

Illustration 186 g00946733

Correct brake accumulator charge pressure is necessary for efficient hydraulic brake operation.

Special tools and equipment are required to test the accumulator.

Reference: For the correct testing and charging procedures for the brake accumulator, refer to Systems Operation, Testing and Adjusting, “Brake Accumulator - Test and Charge” for the machine that is being serviced, or consult your Caterpillar dealer.

i01857629

Brake Oil Cooler Screen - Clean

SMCS Code: 4257-070; 4295-070

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Clean the brake oil cooler screen whenever there is a failure of the hoist, torque converter or brake hydraulic system.

Illustration 187 g00946944

Note: Hand tighten the NPT pipe nipple. Do not use tools.

1. Remove tank drain valve plug (1) from the hoist, torque converter and brake hydraulic tank. Open the drain valve by installing a 1 1/4 inch NPT pipe nipple, 88 mm (3.50 inch) long, to open the internal drain valve and drain the oil into a suitable container.

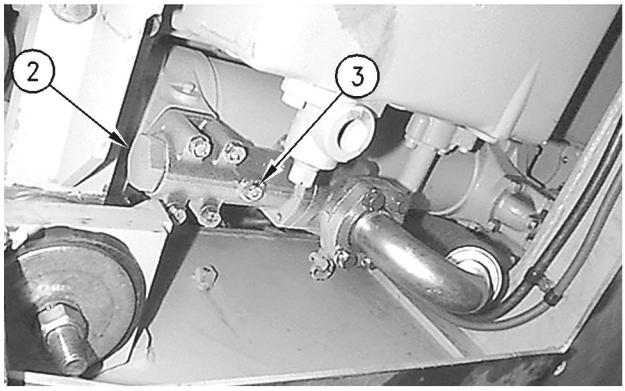

Illustration 188 g00946983

2. Remove drain plug (3) from the oil cooler and drain the oil into a suitable container. Clean and install the plug.

3. Remove plug (2) from the end of the cooler.

4. Remove the screen. Clean the screen in clean nonflammable solvent.

5. Install the screen in the cooler.

6. Clean plug (2) in clean, nonflammable solvent. Inspect the seal. Replace the seal if the seal is damaged.

7. Install the plug.

8. Fill the hydraulic tank.

Reference: For information on lubricants and refill capacities, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

9. Start the engine and operate the engine at low idle. Check for leaks and make any necessary repairs.

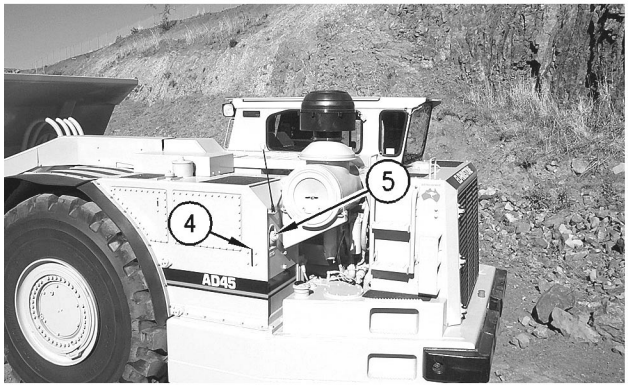

Illustration 189 g00947009

10. With the oil cold, check the oil level in sight gauge (4). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

11. Maintain the oil level to the FULL mark in the sight gauge.

12. Remove oil filler cap (5) and add oil if necessary.

i01857359

Brake Oil Filter - Replace

SMCS Code: 4295-510

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

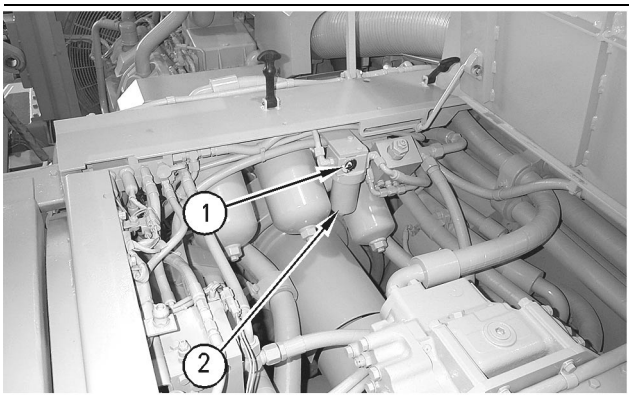

Illustration 190 g00946864

Note: The brake oil filter should be replaced every 500 service hours or 3 months. This frequency can increase if the filter is dirty. Observe brake filter indicator (1) while repeatedly applying the brakes. Replace the filter if the indicator is in the red area with the machine running and the brake accumulator charging.

1. Release the pressure in the braking system.

   Reference: For information on releasing the pressure in the braking system, refer to Braking System, Systems Operation, Testing and Adjusting, “Braking System Pressure - Release” for the machine that is being serviced.

2. Remove brake filter housing (2). Remove the element and discard.

3. Wash the filter housing in clean nonflammable solvent.

4. Inspect the seal in the filter housing. If the seal is damaged, replace the seal with a new seal.

5. Install the new element in the housing. Install the element and housing in the housing base.

6. Start the engine and operate the engine at low idle. Inspect for leaks.

Illustration 191 g00946895

7. With the oil cold, check the oil level in the sight gauge (3). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

8. Maintain the oil level to the FULL mark in the sight gauge.

9. Remove oil filler cap (4) and add oil if necessary.

i01857847

Braking System - Test

SMCS Code: 4250-081; 4251-081; 4267-081

Note: Perform the following brake test at the start of each shift and before entering a ramp.

Be sure the area around the machine is clear of personnel and obstructions. Be sure the steering frame lock is in the stored position.

Test the brakes on a dry, level surface. Fasten the seat belt before testing the brakes.

The following tests are to determine if the parking brake and the service brakes are functional. These tests are not intended to measure the maximum brake holding effort. Brake holding effort required to hold a machine at a specific engine rpm will vary from machine to machine due to differences in engine setting, power train efficiency, etc., as well as differences in brake holding ability.

Engine rpm at beginning of machine movement, with the brake applied, should be compared against the engine rpm your specific machine was able to hold on a prior test, as an indication of system deterioration.

To carry out the brake test, first start the engine and let the brake oil pressure build up to the operating range. The parking brake will stay engaged until operating oil pressure has been reached and the parking brake control is moved to the OFF position (parking brake disengaged). Once operating oil pressure has been reached a test of the braking system can be commenced.

Service Brake Holding Ability Test

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move during test, reduce the engine speed immediately and engage the parking brake.

1. Move the transmission control to the NEUTRAL position. Start the engine.

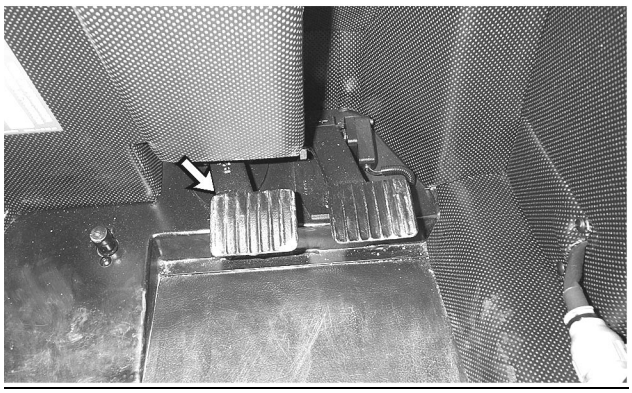

Illustration 192 g00940766

2. Apply the service brake pedal.

Illustration 193 g00940749

3. Disengage the parking brake by moving the parking brake control to the OFF position.

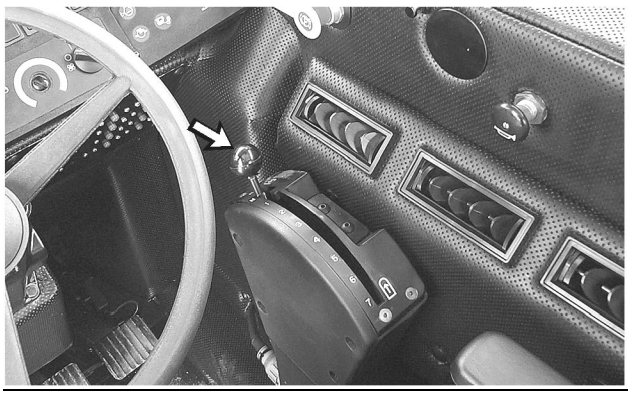

Illustration 194 g00992888

4. Move the transmission control to the FIRST SPEED FORWARD position.

5. Gradually increase the engine speed to 1300 rpm. The machine should not move.

6. Reduce the engine speed to low idle. Move the transmission control to the NEUTRAL position. Engage the parking brake. Stop the engine.

NOTICE
If the machine moved while testing the brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the service brake before returning the machine to operation.

Parking Brake Holding Ability Test

NOTICE
The standard parking brake control is a pull-to-engage type. When the knob is pulled OUT, the parking brake will be engaged.

Certain mining regulations require machines to be equipped with a push-to-engage parking brake control. When the knob is pushed IN, the parking brake is engaged.

Before operating the machine, ensure you are familiar with the operation of the parking brake control.

Standard Pull-to-Engage Type

⚠ WARNING

Personal injury can result if the machine moves while testing the parking brake.

If the machine begins to move during the test, reduce the engine speed immediately and apply the service brakes.

1. Move the transmission control to the NEUTRAL position. Start the engine.

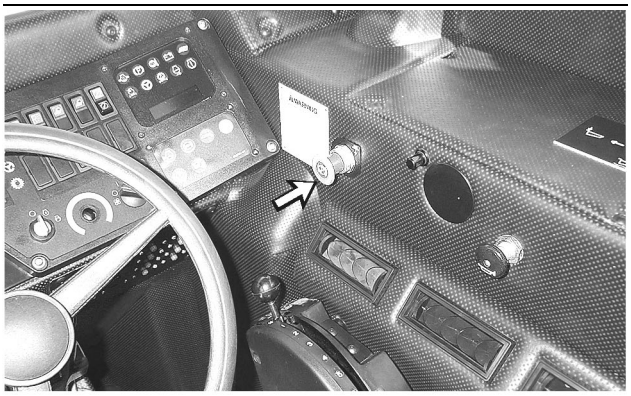

Illustration 195 g00940749

2. Engage the parking brake by pulling the parking brake control knob out to the ON position.

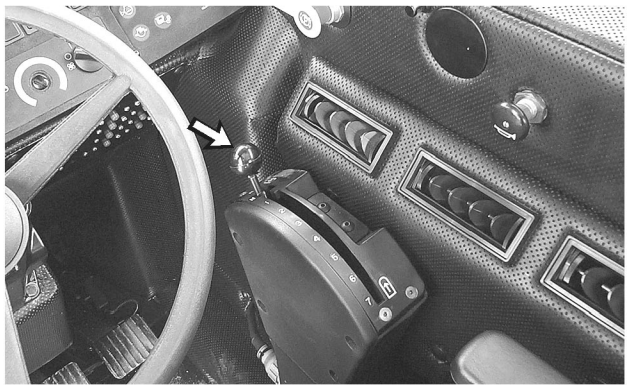

Illustration 196 g00992888

3. Move the transmission control to FIRST SPEED FORWARD position.

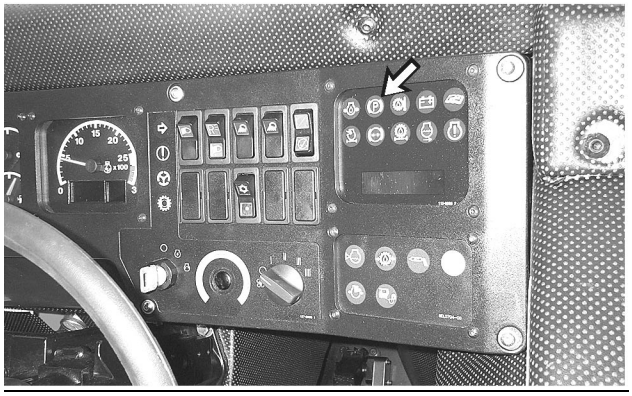

Illustration 197 g00947041

Note: The parking brake indicator and the action lamp should illuminate. The action alarm should sound.

4. Gradually increase the engine speed to 1300 rpm. The machine should not move.

5. Reduce the engine speed to low idle. Move the transmission control to the NEUTRAL position. Lower the bucket to the ground. Stop the engine.

NOTICE

If the machine moved while testing the brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the parking brakes before returning the machine to operation.

Optional Push-to-Engage Type

⚠ WARNING

Personal injury can result if the machine moves while testing the parking brake.

If the machine begins to move during the test, reduce the engine speed immediately and apply the service brakes.

1. Move the transmission control to the NEUTRAL position. Start the engine.

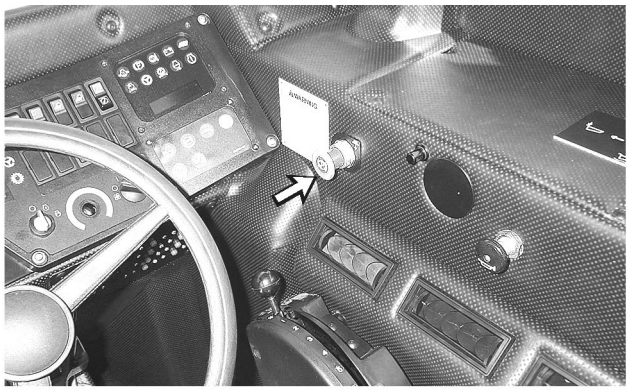

Illustration 198 g00940749

2. Engage the parking brake by pushing the parking brake control in to the ON position.

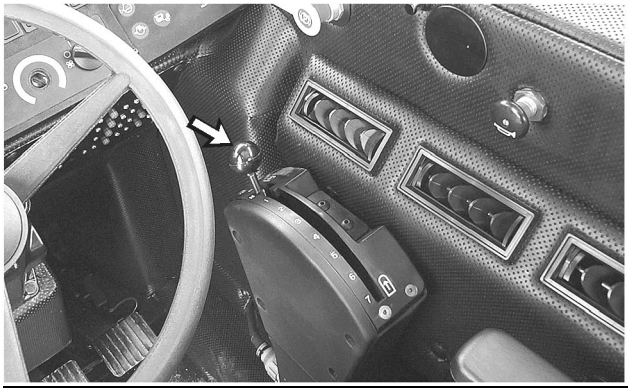

Illustration 199 g00992888

3. Move the transmission control to the FIRST SPEED FORWARD position.

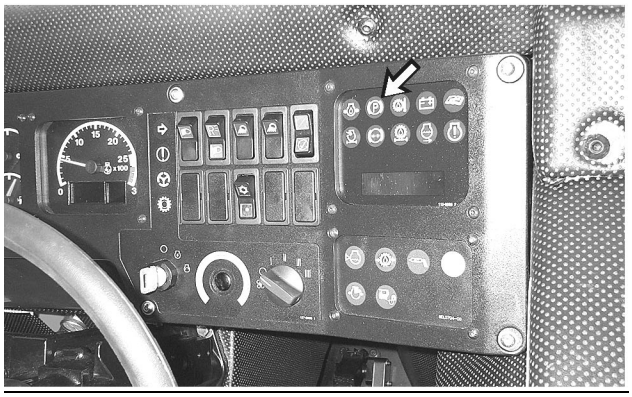

Illustration 200 g00947041

Note: The parking brake indicator and the action lamp should illuminate. The action alarm should sound.

4. Gradually increase the engine speed to 1300 rpm. The machine should not move.

5. Reduce the engine speed to low idle. Move the transmission control to the NEUTRAL position. Stop the engine.

NOTICE
If the machine moved while testing the brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the parking brakes before returning the machine to operation.

i01862774

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

Note: Clean the cab air filter weekly or when a reduction of air circulation in the cab is noticed. If working in less dusty conditions, the service interval for the cab air filters can be extended.

Air Conditioning Recirculation Filter

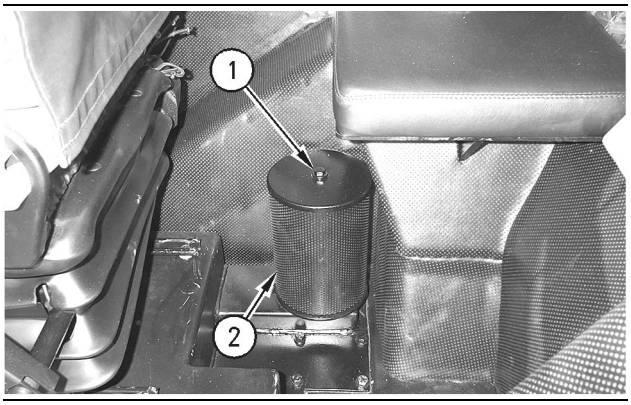

Illustration 201 g00949643

1. Remove bolt (1) that fastens recirculation filter assembly (2).

2. Remove the cover and the air conditioning recirculation filter from the canister.

3. Clean the recirculation filter using air pressure. When you use air pressure, the maximum air pressure should be 205 kPa (30 psi).

4. Install the filter in the canister. Install the cover and refit the filter assembly.

Note: When rips or tears are noticed in the filter element, or a reduction of air circulation is noticed in the cab after cleaning filter, install a new element.

Air Conditioning Filter

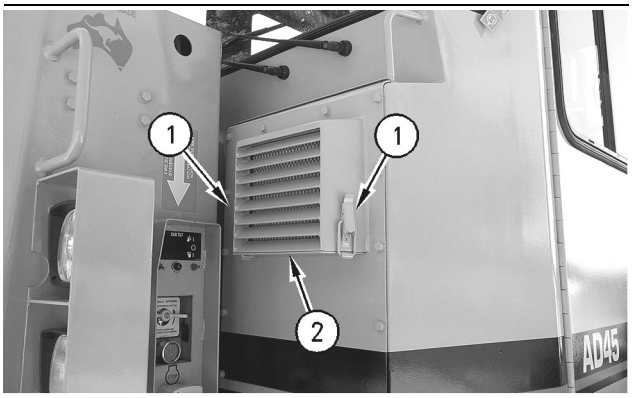

Illustration 202 g00949651

1. Release two latches (1). Remove air conditioning filter cover (2).

Illustration 203 g00949654

2. Remove air conditioning filter (3) from the air conditioning duct.

3. Clean the filter element with pressure air or wash the element in warm water and a nonsudsing household detergent. When you use air pressure, the maximum air pressure is 205 kPa (30 psi). When you use water pressure, the maximum water pressure is 280 kPa (40 psi).

4. If washed, rinse the element in clean water and air dry thoroughly.

5. Install the clean filter element and cover.

Note: When rips or tears are noticed in the filter element, or a reduction of air circulation is noticed in the cab after cleaning filter, install a new element.

Cab Pressurizer Filter

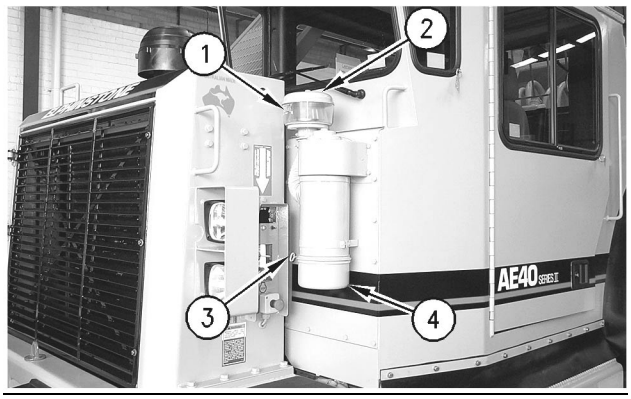

Illustration 204 g00949690

Note: When the debris reaches the full level on the precleaner, empty the precleaner.

1. Loosen the retaining nut and remove cover (2). Remove precleaner cup (1). Empty the precleaner cup.

2. Wash the cover and the precleaner cup in clean water and allow to air dry.

3. Install the precleaner cup and the cover. Tighten the retaining nut finger tight. Do not use a tool to tighten the retaining nut.

4. Loosen clamp bolt (3) and remove end cap (4). Remove the rubber baffle from the end cap. Empty the dust from the end cap.

5. Install the rubber baffle in the end cap.

6. Remove the wing nut on the filter element. Remove the filter element.

7. Clean the filter element with pressure air or wash the element in warm water and a nonsudsing household detergent. When you use air pressure, the maximum air pressure is 205 kPa (30 psi). When you use water pressure, the maximum water pressure is 280 kPa (40 psi).

8. If washed, rinse the element in clean water and air dry thoroughly.

9. Install the filter element and wing nut. Tighten the wing nut finger tight. Do not use a tool to tighten the wing nut.

10. Install end cap (4). Tighten clamp bolt (3) finger tight. Do not use a tool to tighten the clamp bolt.

i01863183

Cab Tilt Pin and Lockdown Pin - Check/Lubricate

SMCS Code: 7301-086; 7301-535

⚠ WARNING

Do not work on or near the cab or left side of the engine until the cab is in the fully tilted position.

Disconnect the batteries by turning the battery disconnect switch to the OFF and remove the key before performing and service work under the cab.

Accidental cab lowering can cause severe personal injury or death from crushing could occur.

1. Tilt the cab.

Reference: For information on tilting the cab, refer to Operation and Maintenance Manual, “Cab - Tilt” for the machine that is being serviced.

2. Check the cab tilt pins and bearings, tilt cylinder pins and bearings and the cab lockdown pins and bearings for wear or damage.

3. Check all mounting bolts and tighten if necessary.

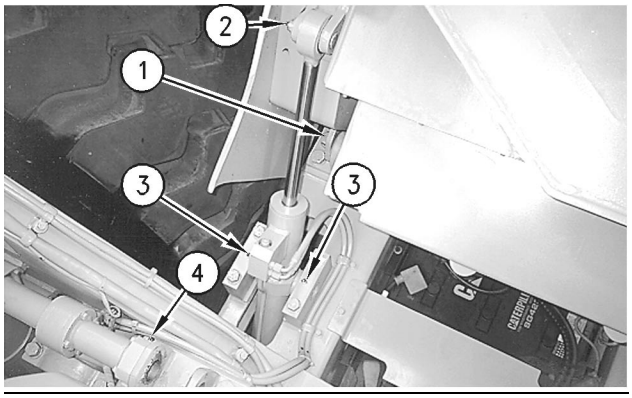

Illustration 205 g00949797

Note: Wipe all fittings before lubricating.

4. Lubricate one fitting (1) on each cab tilt pin.

5. Lubricate the tilt cylinder tilt pin (rod end) through fitting (2).

6. Lubricate the tilt cylinder tilt pins (cylinder anchor end) through two fittings (3).

7. Lubricate one fitting (4) on each cab lockdown pin assembly.

i01863237

Circuit Breakers - Reset

SMCS Code: 1420-529

NOTICE
Replace circuit breakers with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to reset circuit breakers frequently, an electrical problem may exist. Contact your Caterpillar dealer.

Circuit Breakers – Push in the button to reset the circuit breaker. If the electrical system is working properly, the button will remain depressed. If the button does not remain depressed, check the appropriate electrical circuit. Repair the electrical circuit, if necessary.

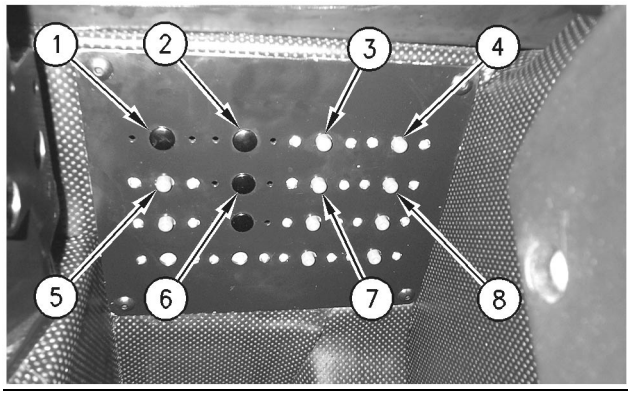

Illustration 206 g00949839

(1) Spare

(2) Spare

(3) 15 Amp - Caterpillar Monitoring System, engine ECM, shutdown to idle system.

(4) 15 Amp - Window wipers/washers, residual brake pressure/stop lights, exhaust back pressure control.

(5) 15 Amp - Engine start switch, fire suppression control.

(6) Spare

(7) 15 Amp - Parking brake control, brake release system.

(8) 15 Amp - Transmission control

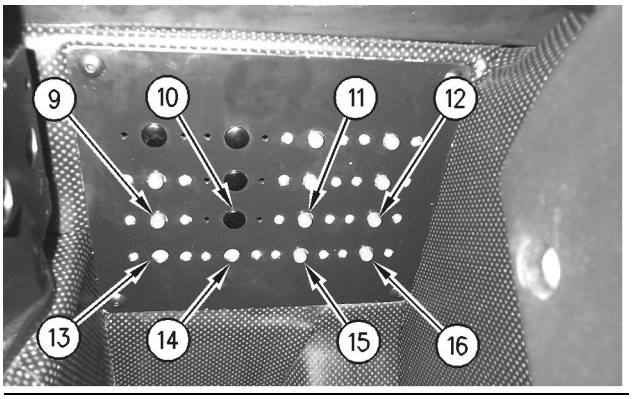

Illustration 207 g00949848

(9) 15 Amp - Engine ECM recorder

(10) Spare

(11) 15 Amp - Block light, rear cab flood light, Automatic Retarder Control (ARC).

(12) 15 Amp - Cab tilt control, hoist/ejector control.

(13) 30 Amp - (Automatic) - Head lights, tail lights, dash lamps.

(14) 30 Amp - (Automatic) - Rear lights.

(15) 30 Amp - Air conditioner.

(16) 15 Amp - Horn, automatic lubrication system, reversing camera, low coolant level control, dash indicator lamps.

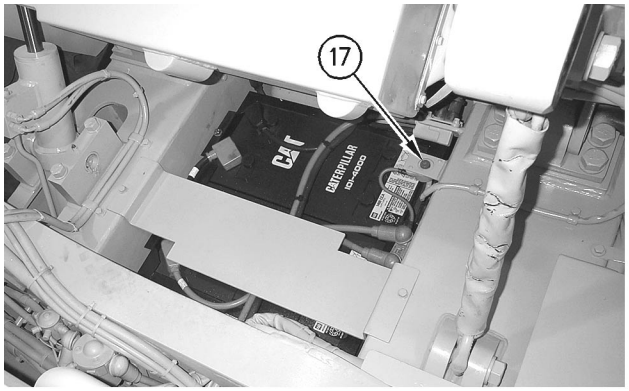

Illustration 208 g00949860

View of battery compartment under the operator's station.

(17) 80 Amp - Main

i01863424

Cooling System Coolant (DEAC) - Change

SMCS Code: 1352-044; 1395-044

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not change the coolant until you read and understand the cooling system information in Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Failure to do so could result in damage to the cooling system components.

Note: This procedure pertains only to Caterpillar Diesel Engine Antifreeze/Coolant (DEAC). This does not pertain to machines that are shipped from the factory with Extended Life Coolant (ELC). Also this does not pertain to the machines that are maintained with Extended Life Coolant (ELC).

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

Illustration 209 g00949921

1. Loosen the pressure cap slowly to relieve cooling system pressure. Remove the pressure cap.

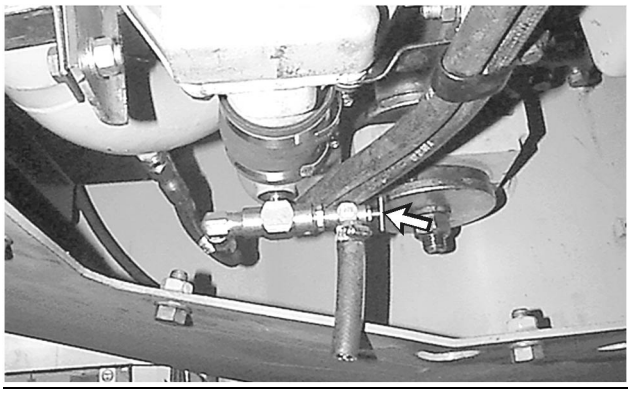

Illustration 210 g00949922

2. Open the drain valve for the engine cooling system. Drain the coolant into a suitable container. The drain valve is located on the bottom radiator tube.

3. Close the drain valve. Fill the system with clean water and a 6 to 10 percent concentration of cooling system cleaner.

4. Start and run the engine for 90 minutes. Stop the engine and drain the cleaning solution into a suitable container.

5. When the engine is stopped, flush the cooling system with water until the draining water is clear. Drain the water into a suitable container.

6. Close the drain valve.

7. Add the coolant solution. Add coolant slowly to help avoid air locks, 20 L (5 US gal) per minute.

Reference: For additional information on the cooling system capacity, refer to the Operation and Maintenance Manual, " Refill Capacities" for the machine that is being serviced.

8. Start the engine. Run the engine with the cooling system pressure cap removed. Run the engine until the water temperature regulator opens and the coolant level stabilizes.

Note: If you are using Caterpillar antifreeze, do not add supplemental coolant additive or change the coolant conditioner element at this time.

Illustration 211 g00949925

9. Maintain the coolant level to within 13 mm (0.50 inch) of the bottom of the filler pipe or to the proper level in the sight gauge.

10. Install the cooling system pressure cap.

11. Stop the engine.

i01863489

Cooling System Coolant (ELC) - Change

SMCS Code: 1352-044-NL; 1395-044-NL

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not change the coolant until you read and understand the cooling system information in Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Failure to do so could result in damage to the cooling system components.

NOTICE

Mixing ELC with other products reduces the effectiveness of the coolant and shortens coolant life. Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specifications for premixed or concentrate coolants. Use only Caterpillar Extender with Caterpillar ELC. Failure to follow these recommendations could result in the damage to cooling systems components.

If ELC cooling system contamination occurs see the topic Extended Life Coolant (ELC) in the Operation and Maintenance Manual, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Note: This procedure pertains to machines using Extended Life Coolant (ELC) only.

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

Illustration 212 g00949921

1. Loosen the pressure cap slowly to relieve cooling system pressure. Remove the pressure cap.

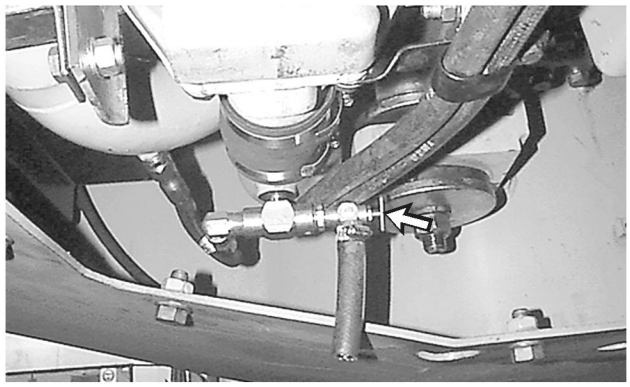

Illustration 213 g00949922

2. Open the drain valve for the engine cooling system. Drain the coolant into a suitable container. The drain valve is located on the bottom radiator tube.

3. Flush the cooling system with water until the draining water is clear. Close the drain valve.

4. Add the coolant solution. Add coolant slowly to help avoid air locks, 20 L (5 US gal) per minute.

   Reference: For information on the cooling system capacity, refer to the Operation and Maintenance Manual, “Refill Capacities” for the machine that is being serviced.

5. Start the engine. Run the engine with the cooling system pressure cap removed. Run the engine until the water temperature regulator opens and the coolant level stabilizes.

Note: If Caterpillar antifreeze is being used, do not add supplemental coolant additive or change the element at this time.

Illustration 214 g00949925

6. Maintain the coolant level to within 13 mm (0.50 inch) of the bottom of the filler pipe or to the proper level in the sight gauge.

7. Install the cooling system pressure cap.

8. Stop the engine.

i01863543

Cooling System Coolant Additive (DEAC) - Add

SMCS Code: 1352-538; 1395-538

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

NOTICE
Adding coolant to an overheated engine could result in damage to the engine. Allow the engine to cool before adding coolant.

If the machine is to be stored in, or shipped to, an area with freezing temperatures, the cooling system must be protected to the lowest outside (ambient) temperature.

The engine cooling system is normally protected to a minimum of–29°C (–20°F) with Caterpillar Antifreeze, when shipped from the factory unless special requirements are defined.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Excessive additive (greater than the recommended 6% initial fill) together with concentrations of antifreeze greater than 60% cause deposits to form and can result in radiator tube blockage and overheating.

Note: This procedure pertains only to Caterpillar Diesel Engine Antifreeze/Coolant (DEAC). This procedure does not pertain to machines that are shipped from the factory with Extended Life Coolant (ELC) and machines that are maintained with Extended Life Coolant (ELC).

Reference: For all cooling system requirements, refer to Caterpillar Machine Fluids Recommendations, SEBU6250, “Cooling System Specifications”.

Use the **8T-5296** Test Kit in order to check the concentration.

Add Coolant Additive (If Required)

Illustration 215 g00949921

1. Loosen the pressure cap slowly to relieve cooling system pressure. Remove the pressure cap.
2. It may be necessary to drain enough coolant from the radiator to allow for the addition of the liquid supplemental coolant additive.

Note: Make sure the coolant is drained into a suitable container.

3. Add liquid supplemental coolant additive (conditioner) according to the requirements of your cooling system as determined by the coolant additive concentration test.
4. Clean the pressure cap and inspect the pressure cap. Install the pressure cap.
5. Start the engine and check for leaks. Allow the coolant level to stabilize.
6. If necessary, add premixed coolant in order to bring the coolant to the proper level in the sight gauge.

Change Coolant Conditioner Element (If Required)

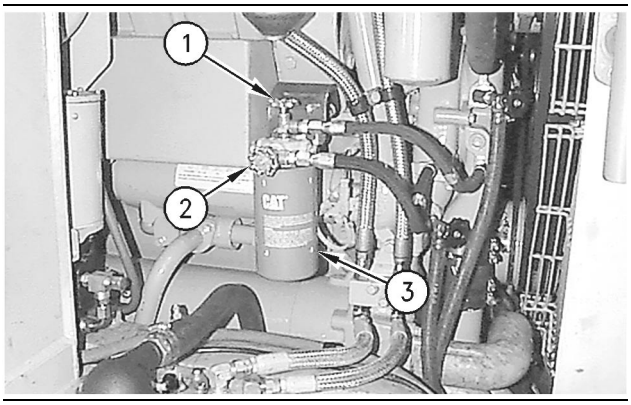

Illustration 216 g00949952

1. Loosen the pressure cap slowly to relieve cooling system pressure. Remove the pressure cap.
2. Close element inlet valve (1) and outlet valve (2). Remove and discard element (3).
3. Clean the element mounting base. Make sure all of the old seal is removed.
4. Replace with a new maintenance element.
5. Coat the seal of a new element with a thin film of clean engine oil.
6. Install and turn the element until the seal contacts the base, then tighten 3/4 of a turn more.
7. Open the inlet and outlet valves.
8. Clean the pressure cap and inspect the pressure cap. Install the pressure cap.
9. Start the engine and check for leaks. Allow the coolant level to stabilize.
10. If necessary, add premixed coolant in order to bring the coolant to the proper level in the sight gauge.

i01863569

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-538-NL; 1395-538-NL

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

NOTICE
Adding coolant to an overheated engine could result in damage to the engine. Allow the engine to cool before adding coolant.

If the machine is to be stored in, or shipped to, an area with freezing temperatures, the cooling system must be protected to the lowest outside (ambient) temperature.

The engine cooling system is normally protected to a minimum of–29°C (–20°F) with Caterpillar Antifreeze, when shipped from the factory unless special requirements are defined.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Excessive additive (greater than the recommended 6% initial fill) together with concentrations of antifreeze greater than 60% cause deposits to form and can result in radiator tube blockage and overheating.

NOTICE
Mixing ELC with other products reduces the effectiveness of the coolant and shortens coolant life. Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specifications for premixed or concentrate coolants. Use only Caterpillar Extender with Caterpillar ELC. Failure to follow these recommendations could result in the damage to cooling systems components.

If ELC cooling system contamination occurs see the topic Extended Life Coolant (ELC) in the Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations”.

When a Caterpillar Extended Life Coolant (ELC) is used, an Extender must be added to the cooling system.

Reference: For the proper service interval, refer to the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the machine that is being serviced.

The amount of extender is determined by the cooling system capacity.

Reference: For information on the cooling system capacity, refer to the Operation and Maintenance Manual, “Refill Capacities” for the machine that is being serviced.

Reference: For all cooling system requirements, refer to Caterpillar Machine Fluids Recommendations, SEBU6250 or consult your Caterpillar dealer.

Illustration 217 g00949921

1. Loosen the pressure cap slowly to relieve cooling system pressure. Remove the pressure cap.

2. It may be necessary to drain enough coolant from the radiator to allow for the addition of the liquid coolant extender.

Note: Make sure that the coolant is drained into a suitable container.

3. Add the recommended amount of ELC Extender to the cooling system.

4. Clean the pressure cap and inspect the pressure cap. Install the pressure cap.

5. Start the engine and check for leaks. Allow the coolant level to stabilize.

6. If necessary, add premixed coolant in order to bring the coolant to the proper level in the sight gauge.

i01863687

Cooling System Level - Check

SMCS Code: 1350-535-FLV; 1395-535-FLV

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 218 g00950097

1. Maintain the coolant level in the sight gauge located on the right side of the machine. If it is necessary to add coolant daily, check for leaks.

2. Inspect the radiator core for debris. Clean the radiator core, if necessary.

   Reference: For information on cleaning the radiator core, refer to the Operation and Maintenance Manual, “Radiator Core - Clean” for the machine that is being serviced.

Illustration 219 g00949921

3. If coolant level is low, loosen the pressure cap slowly to relieve pressure. Remove the pressure cap. Add coolant as required to within 13 mm (0.50 inch) of the bottom of the filler pipe or to the proper level in the sight gauge.

4. Inspect the pressure cap and cap seal for damage, deposits or foreign material. Clean the pressure cap with a clean cloth or replace the cap if it is damaged.

5. Install the cooling system pressure cap.

i01863732

Cooling System Pressure Cap - Clean/Replace

SMCS Code: 1382-070; 1382-510

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

Illustration 220 g00949921

1. Loosen the pressure cap slowly in order to relieve cooling system pressure. Remove the pressure cap.

2. Inspect the pressure cap for damage, foreign material and for deposits.

3. Inspect the condition of the pressure cap seal. Replace the pressure cap if damaged. If the seal is not damaged, use a 9S-8140 Pressurizing Pump to pressure test the pressure cap. The correct cap relief pressure is stamped on the radiator cap. If the pressure cap does not hold the correct pressure, install a new cap.

4. Install the pressure cap.

i01863760

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

Replace the water temperature regulator on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system.

The water temperature regulator should be replaced after the cooling system has been cleaned. Replace the water temperature regulator while the cooling system is completely drained or while the cooling system coolant is drained to a level that is below the water temperature regulator housing.

NOTICE

Failure to replace the engine's water temperature regulator on a regularly scheduled basis could cause severe engine damage.

Note: If you are only replacing a water temperature regulator, drain the cooling system coolant to a level that is below the water temperature regulator housing.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

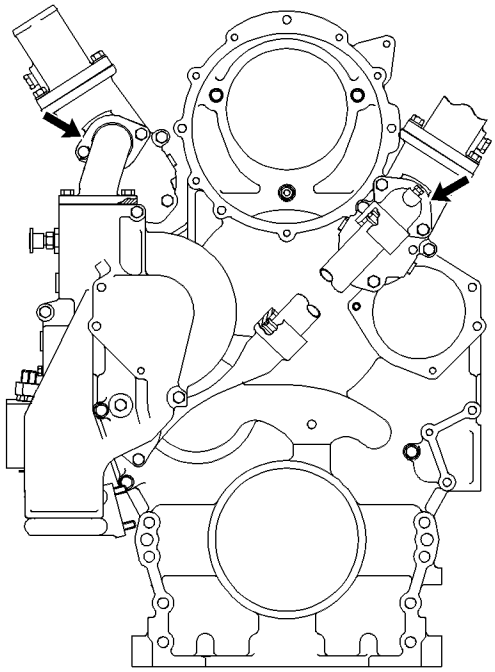

Illustration 221 g00950132
Front view of engine

1. Remove the water temperature regulator housing.

2. Remove the gasket, the water temperature regulator and the seal from the water temperature regulator housing.

NOTICE
Former water temperature regulators may be used, if they meet the test specifications and are not damaged or have excessive buildup or deposits.

NOTICE
Since Caterpillar engines incorporate a shunt design cooling system, it is mandatory to always operate the engine with a water temperature regulator.

Depending on load, failure to operate with a water temperature regulator could result in either an overheating or an overcooling condition.

NOTICE
If the water temperature regulator is installed incorrectly, it will cause the engine to overheat.

3. Install a new seal in the water temperature regulator housing. Install a new water temperature regulator and a new gasket. Install the water temperature regulator housing and the hose.

4. Refill the cooling system.

Reference: For all cooling system requirements, refer to the Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations”.

Reference: For information on the cooling system capacity, refer to the Operation and Maintenance Manual, “Refill Capacities” for the machine that is being serviced.

i01864361

Differential Thrust Pin Clearance - Check

SMCS Code: 3258-535-T9

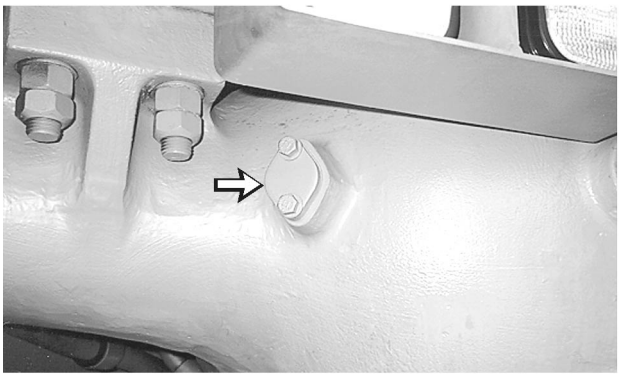

Illustration 222 g00950497

For the correct thrust pin adjustment procedures for the front and rear differentials, refer to Power Train, Specifications, “Differential and Bevel Gear” for the machine that is being serviced or contact your Caterpillar dealer.

i01863799

Differential and Final Drive Oil - Change

SMCS Code: 3258-044; 4050-044

Note: The oil change interval for the differential and for the final drives can be monitored with the S·O·S (Scheduled Oil Sampling) program. The change intervals is based on the condition of the oil. If scheduled oil sampling program is not used, the oil change interval for the differential and the final drives is at 2000 service hours.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Wipe covers and surfaces around openings before checking or adding oil. Park on a level surface.

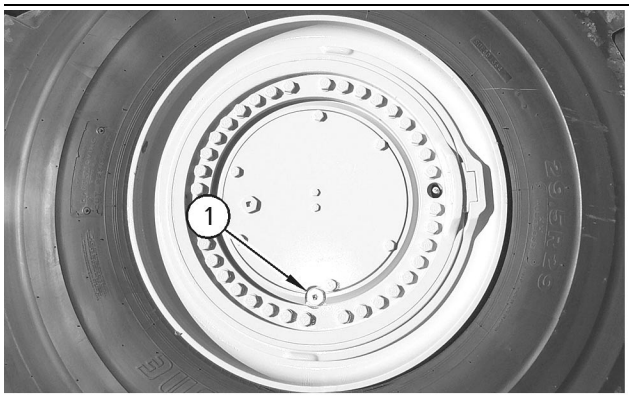

Illustration 223 g00950196

1. Position the wheels so that final drive drain/level plugs (1) are facing downward. Remove the final drive drain/level plugs and allow the oil to drain into a suitable container.
2. Clean the area around the drain/level plug. Clean the drain/level plug.

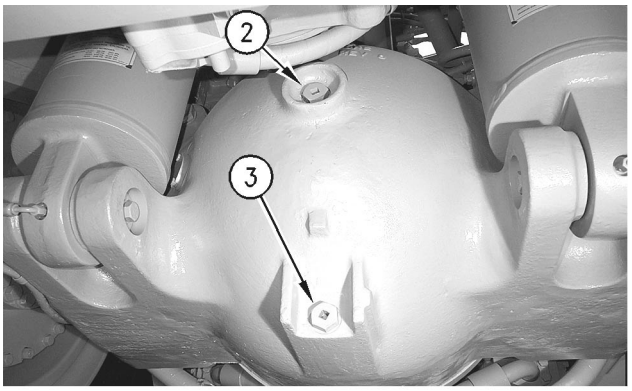

Illustration 224 g00950204

View of front differential

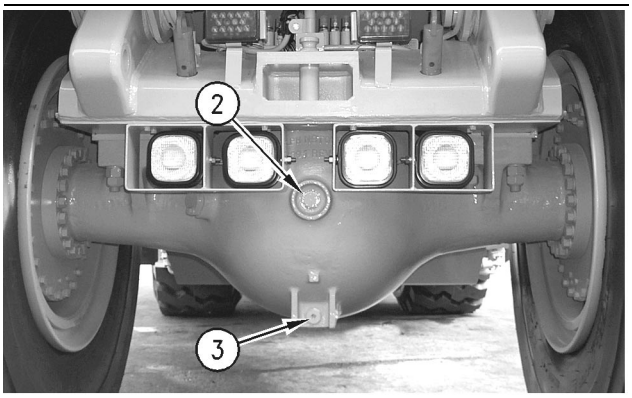

Illustration 225 g00950210

View of rear differential

3. Remove front differential drain plugs (3) and allow the oil to drain into a suitable container.
4. Clean the drain plugs and install the drain plugs.
5. Remove differential filler plugs (2). Fill the differential to the bottom of the filler plug opening.

   Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.
6. Clean the area around the filler plug. Clean the filler plug. Install the filler plug.

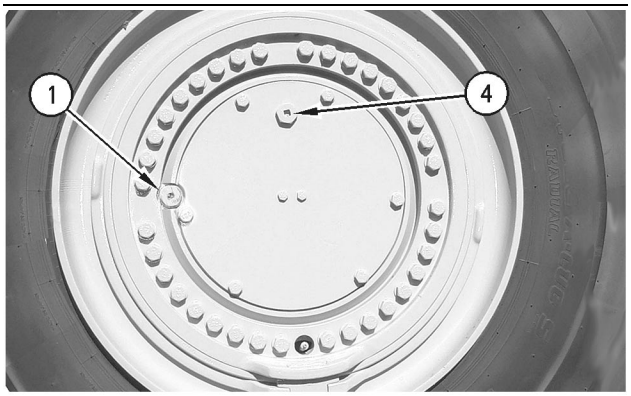

Illustration 226 g00950216

7. Position each wheel so that drain/level plugs (1) for the final drives are even with the center line of the wheel. Remove filler plugs (4).

8. Fill the final drives slowly to the bottom of the drain/level plug openings.

Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

9. Install the drain/level plugs. Clean the filler plugs and install the filler plugs.

10. Operate the machine and recheck the oil level. The oil level should reach the bottom of the drain/level plug openings.

11. Add oil if necessary. Install the plugs.

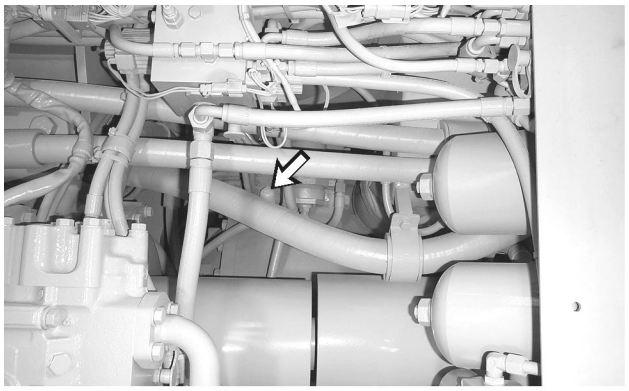

Illustration 227 g00954302

Location of the front axle breather

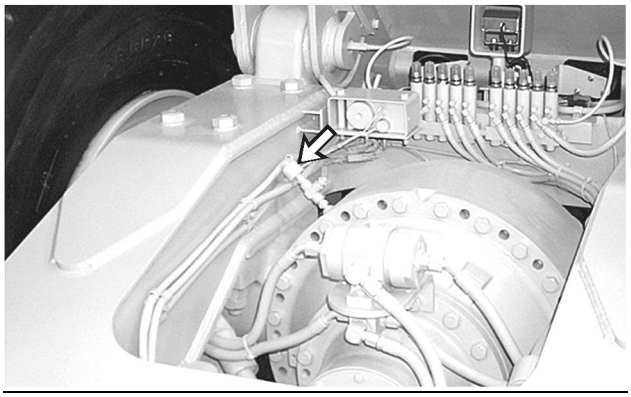

Illustration 228 g00954303

Location of the rear axle breather for AD45 machines

Illustration 229 g00954304

Location of the rear axle breather for AE40 Series II machines

12. Remove the breathers from the front and rear axle housing.

13. Wash the breathers in, nonflammable solvent.

14. Allow the breathers to dry.

15. Install the clean breathers.

i01864250

Differential and Final Drive Oil Level - Check

SMCS Code: 3258-535-FLV; 4050-535-FLV

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Wipe covers and surfaces around openings before checking or adding oil. Park on a level surface.

Note: Perform Steps 1 and 2 to the final drive on each wheel.

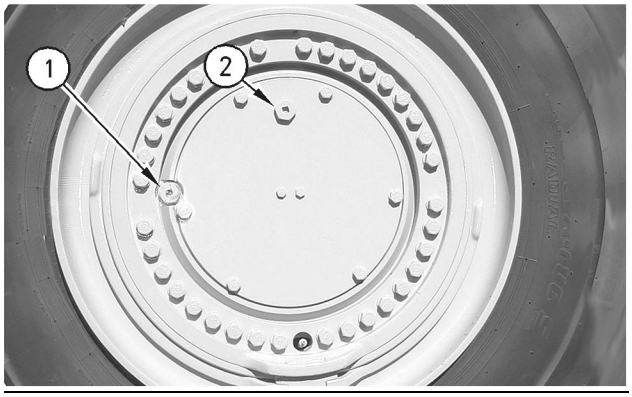

Illustration 230 g00950397

1. Position the wheels so that the drain/level plug (1) for the final drive is even with the center line of the wheel.

2. Remove the drain/level plug. The oil level should be at the bottom of the drain/level plug opening. If necessary, remove filler plug (2) and add oil through the filler opening.

   Reference: For information on lubricants, refer to the Operation and Maintenance Manual, “Lubricant Viscosities ” for the machine that is being serviced.

Note: If the oil level is higher than the filler plug opening, do not allow the oil to drain to the level of the filler plug opening. Install the filler plug.

Note: All of the drain/level plugs are magnetic plugs. The magnetic will attract metal from the oil. A bearing failure is indicated by an increased amount of metal on the magnetic plug.

Note: If any abnormal particles are found, consult your Caterpillar dealer.

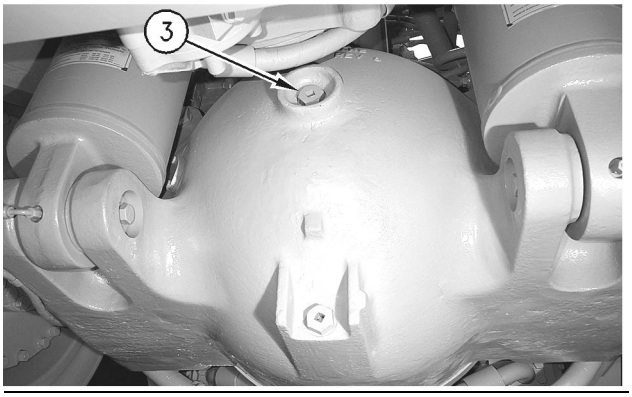

Illustration 231 g00950420

View of front differential

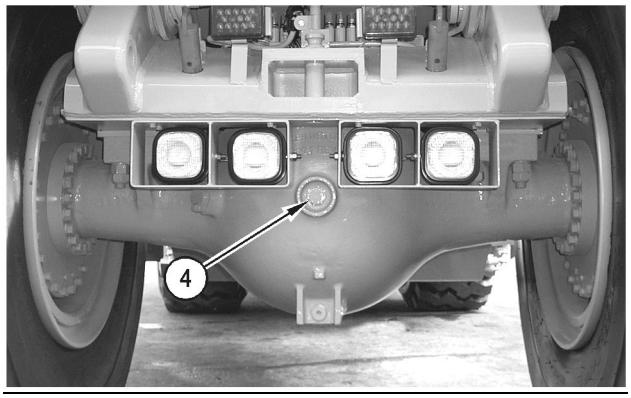

Illustration 232 g00950427

View of rear differential

3. Remove differential filler plugs (3) and (4). The oil level should be at the bottom of the filler plug openings. Add oil, if necessary.

   Reference: For information on lubricants, refer to the Operation and Maintenance Manual, “Lubricant Viscosities ” for the machine that is being serviced.

Note: If the oil level is higher than the filler plug opening, do not allow the oil to drain to the proper level. Install the filler plugs.

i01864384

Drive Shaft Universal Joints, Splines and Bearings - Inspect/Lubricate

SMCS Code: 3251-040; 3251-086; 3253-040-SN; 3253-086-SN; 3267-040-BD; 3267-086-BD

Inspect the drive shaft universal joints for wear, loose bolts, or missing bolts. Tighten loose bolts and replace missing bolts. Inspect the drive shaft splines and bearings for wear. Replace worn components.

NOTICE

Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Wipe off the fittings before any lubricant is applied.

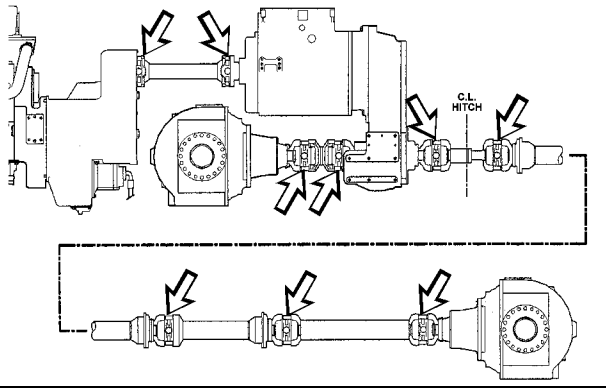

Illustration 233 g00950506

1. Lubricate all drive shaft universal joints through nine fittings.

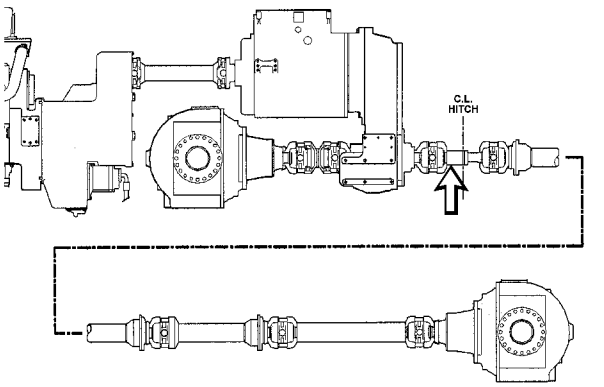

Illustration 234 g00950507

2. Lubricate the center drive shaft slip joint spline through the fitting.

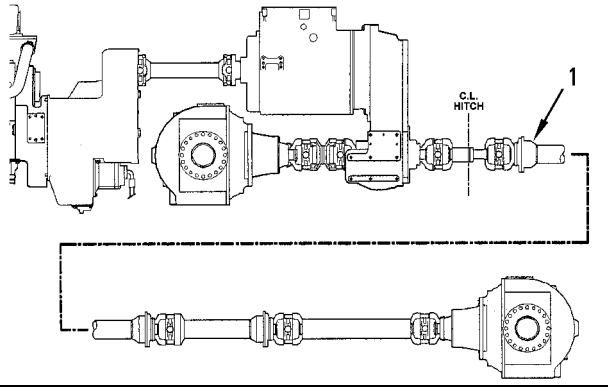

Illustration 235 g00950509

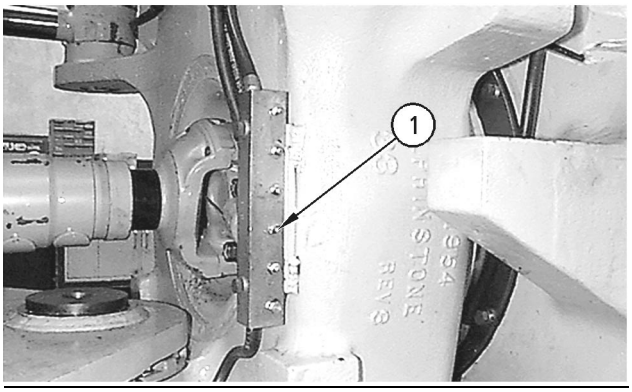

Illustration 236 g00950510

3. Lubricate the front oscillation drive shaft bearing through remote mounted fitting (1).

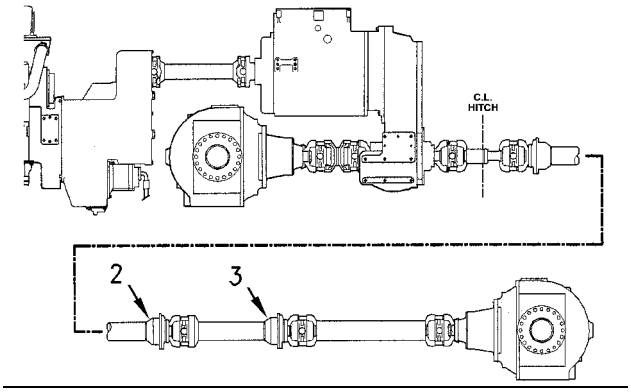

Illustration 237 g00950511

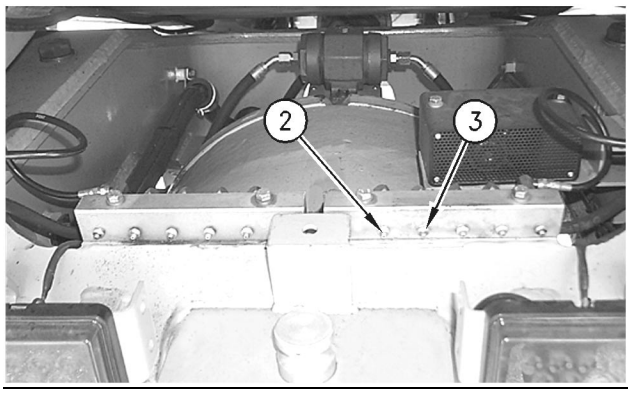

Illustration 238 g00950513

Rear view of AD45 machine

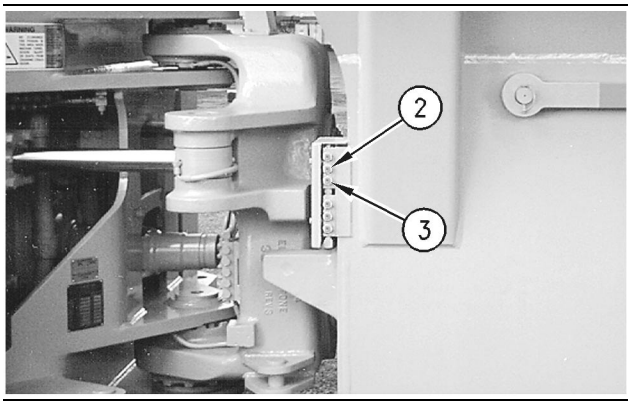

Illustration 239 g00950527

Left side view of AE40 Series II machine

4. Lubricate the rear oscillation drive shaft bearing through one remote mounted fitting (2).

5. Lubricate the rear intermediate drive shaft center bearing through one remote mounted fitting (3).

i01864514

Ejector Cylinder Bearing - Lubricate

SMCS Code: 5305-086-BD

NOTICE

Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Wipe off the fittings before any lubricant is applied.

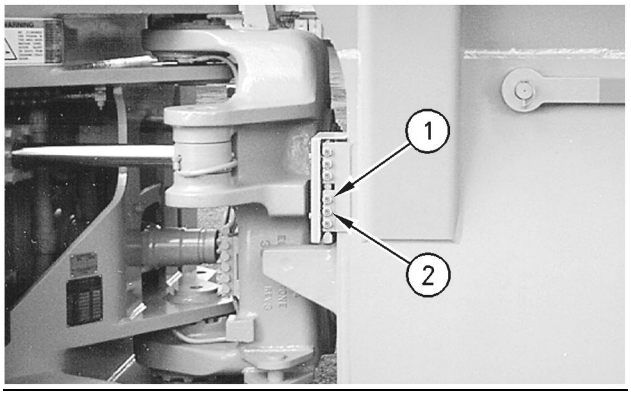

Illustration 240 g00950579

1. Lubricate the left ejector cylinder bearing in the rod end of the ejector cylinder through remote mounted fitting (1).

2. Lubricate the right ejector cylinder bearing in the rod end of the ejector cylinder through remote mounted fitting (2).

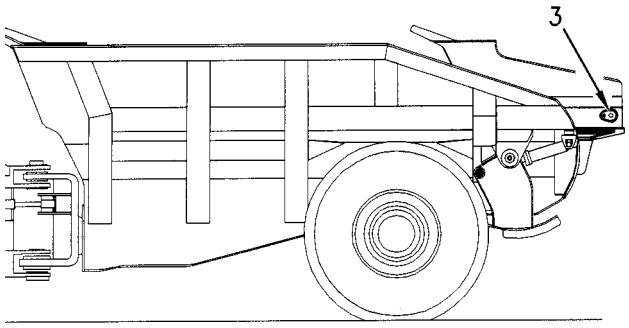

Illustration 241 g00950580

3. Move the ejector plate to the fully ejected position. Lubricate the ejector body cylinder bearings in the head end of the ejector cylinder through two fittings (3) (one on each side of the machine).

i01864765

Ejector Line Screen - Inspect/Clean

SMCS Code: 5057-040-Z3; 5057-070-Z3

Clean the ejector line screen every 1000 service hours or 6 monthly or whenever there is failure of the regenerative sequence valve.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

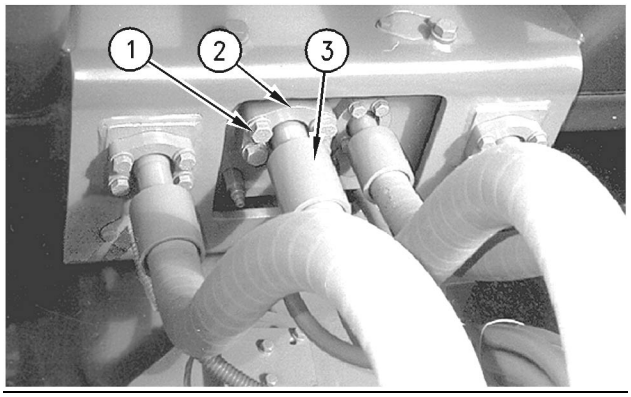

Illustration 242 g00950622

1. Remove four bolts (1), flanges (2) and the body end of hose assembly (3).

2. Remove the ejector line screen adapter from behind the hose flanges.

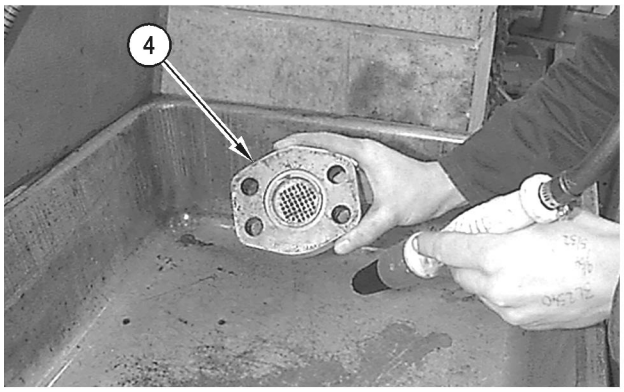

Illustration 243 g00950623

3. Wash screen adapter (4) in clean, nonflammable solvent. Inspect the screen mesh. Replace the screen adapter if the mesh is worn or damaged.

4. Inspect the hose assembly seals and the screen adapter seals. Replace the seals if they are worn or damaged.

5. Install the screen adapter, hose assembly, flanges, and bolts.

6. Start the engine. Eject and retract the ejector plate several times. Check for leaks.

i01864768

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070-PY; 1054-510-PY

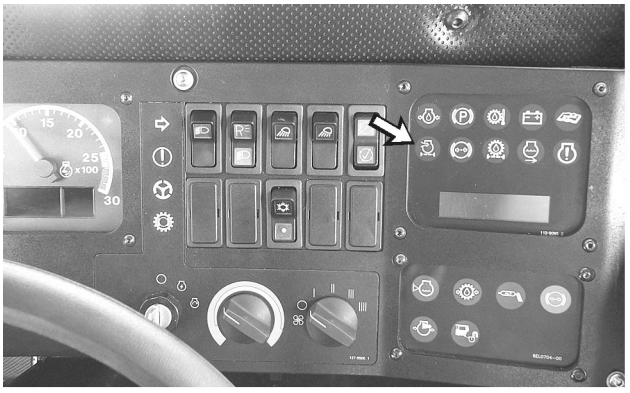

Illustration 244 g00950627

Service the air cleaner daily or if the air filter restriction indicator located on the dash panel comes on. Stop the engine.

NOTICE

Service the air cleaner only with the engine stopped. Engine damage could result if the air cleaner is serviced while the engine is running.

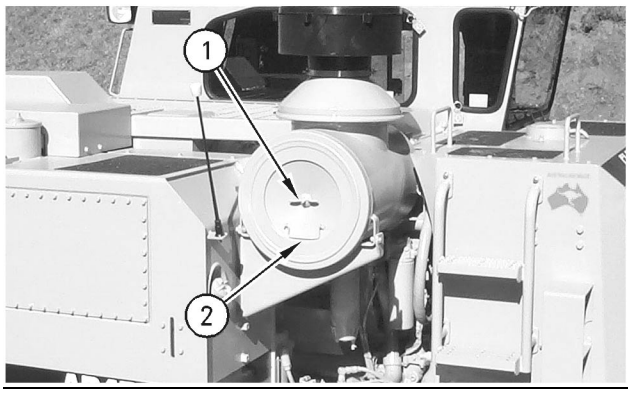

Illustration 245 g00950630

1. Loosen wing nut (1).

2. Use handle (2) to remove the engine air filter primary element from the air cleaner housing.

3. Inspect the air filter service indicator on the secondary element. This indicator is normally green. If the indicator is red replace the secondary element.

Reference: For the correct procedure to replace the secondary filter element, refer to the Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace” for the machine that is being serviced.

Illustration 246 g00950634

4. Clean the inside of the air cleaner housing.

5. Inspect the primary element. If the pleats, the gaskets or the seals are damaged, discard the primary element. Replace a damaged primary element with a clean primary element.

NOTICE
Do not clean the primary elements by bumping or tapping them. Do not use primary elements with damaged pleats, gaskets or seals. Engine damage can result.

Make sure the cleaned primary elements are completely dry before installing them into the filter housing. Water remaining in the elements can cause false indications of contamination in S·O·S Analysis test results.

6. If the primary element is not damaged, clean the primary element. The primary element can be cleaned by using the following methods:

- Pressure air.
- Pressure water.
- Detergent washing.

When you use pressure air, the maximum air pressure is 205 kPa (30 psi). When you use pressure water, the maximum water pressure is 280 kPa (40 psi).

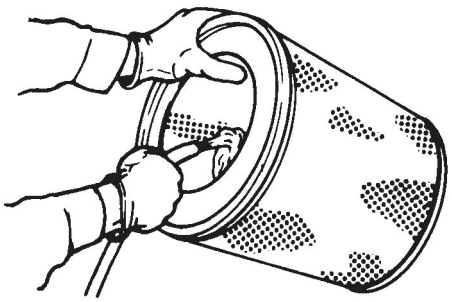

Illustration 247 g00905242

7. When you clean the inside pleats and the outside pleats, direct the air along the pleats or direct the water along the pleats.

The primary element can be washed in a solution that consists of warm water and of nonsudsing household detergent. Fully rinse the pleats. Allow the primary element to air dry completely.

8. Inspect the primary element after you clean the primary element. Do not use a primary element if the pleats, the gasket or the seals are damaged.

9. Cover the clean primary element. Store the primary element in a clean, dry location.

A primary element may be cleaned for a maximum of six times. Also replace the primary element if the primary element has been in service for one year.

10. Install a clean primary element and the wing nut. Tighten the wing nut finger tight. Do not use a tool to tighten the nut.

Note: Make sure that the primary filter element is properly seated and sealed.

Note: If the air filter restriction indicator remains on after starting the engine, or the exhaust smoke is still black after installing a clean primary element, install a new primary filter element. If the indicator remains on after installing a new primary filter element, replace the secondary filter element.

Reference: For the correct procedure to replace the secondary filter element, refer to the Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace” for the machine that is being serviced.

i01864772

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510-SE

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

NOTICE
Always replace the secondary element. Do not attempt to reuse it by cleaning. Engine damage could result.

Replace the engine air filter secondary element under the following conditions:

- A clean primary element has been installed and a warning for the air filter still occurs.
- The engine air filter primary element is serviced for the third time.
- The exhaust smoke remains black and a clean primary element has been installed.

1. Remove the wing nut and the primary element.

Reference: For additional information, refer to the Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace” for the machine that is being serviced.

Illustration 248 g00950640

2. Remove the split pin, air filter service indicator, and the secondary element .

3. Cover the air inlet opening. Clean the inside of the air cleaner housing.

4. Direct low air pressure into the air filter service indicator in order to reset the indicator. This will change the color of the indicator from a red color to a green color.

5. Uncover the air inlet opening. Install a new secondary element. Install the air filter service indicator and the split pin.

6. Install a clean primary element and wing nut. Tighten the wing nut finger tight. Do not use a tool to tighten the nut.

i01864776

Engine Air Precleaner - Clean

SMCS Code: 1055-070

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

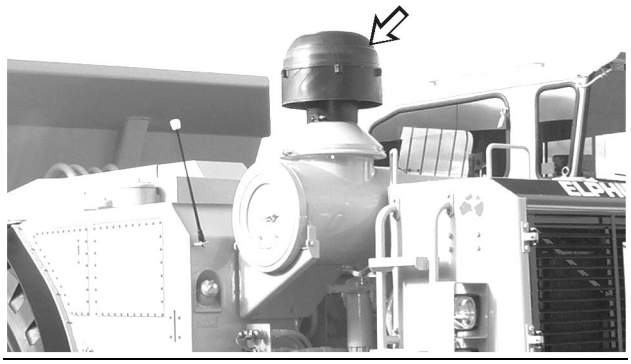

Illustration 249 g00950641

1. Stop the engine.
2. Remove the engine air precleaner.
3. Inspect the precleaner inlet screen for dirt and for trash. If the screen is dirty, clean the screen with compressed air.
4. Check the air intake precleaner rotor operation.
5. Periodically remove the precleaner and wash in water.

i01865682

Engine Crankcase Breather - Clean

SMCS Code: 1317-070

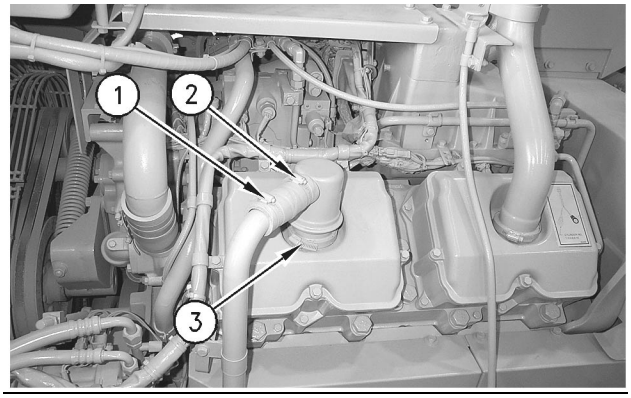

Illustration 250 g00950943

1. Stop the engine.
2. Loosen hose clamps (1) and (2) and remove the hose from the breather.
3. Loosen breather retaining clamp (3) and remove the clamp and the breather.
4. Wash the breather in a clean, nonflammable solvent. Shake the element dry or use pressure air in order to dry the breather element.
5. Inspect the hose for damage. Replace the hose, if necessary.
6. Install the breather. Tighten the breather clamp.
7. Install the hose on the breather. Tighten the hose clamps.

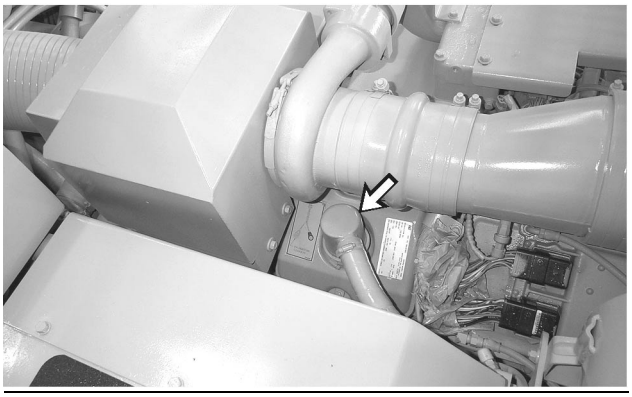

Illustration 251 g00950944

8. Repeat Steps 1 through 7 for the breather on the other side of the engine.

i01865691

Engine Mounts - Inspect

SMCS Code: 1152-040

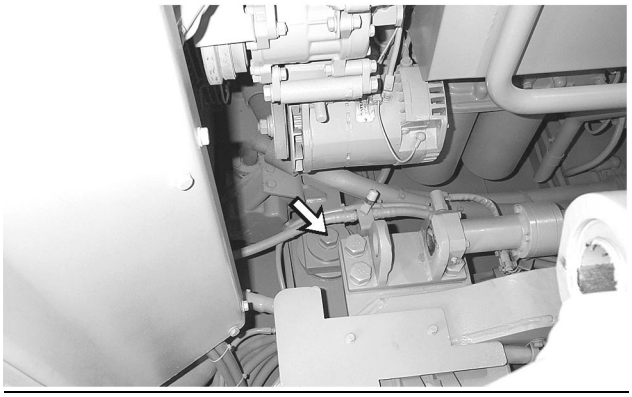

Illustration 252 g00950960

Illustration 253 g00950963

Caterpillar recommends inspecting the engine mounts for deterioration and for proper bolt torque. This will help to prevent excessive engine vibration that is caused by improper mounting.

Reference: For the proper bolt torques for the engine mounts, refer to Specifications, “3408E HEUI Engine” for the machine that is being serviced.

i01866047

Engine Oil Level - Check

SMCS Code: 1000-535-FLV

NOTICE
Do not underfill or overfill the engine crankcase with oil. Either condition can cause engine damage.

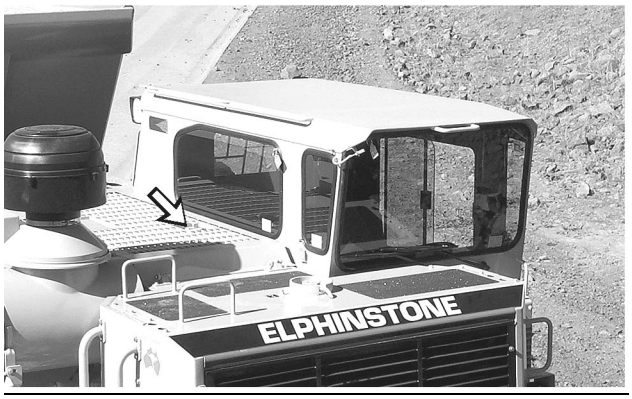

Illustration 254 g00951104

Check the engine oil level with the machine level and the parking brake engaged.

The dipstick is located on the cab side of the engine.

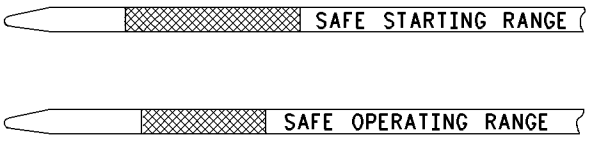

Illustration 255 g00951105
Engine dipstick

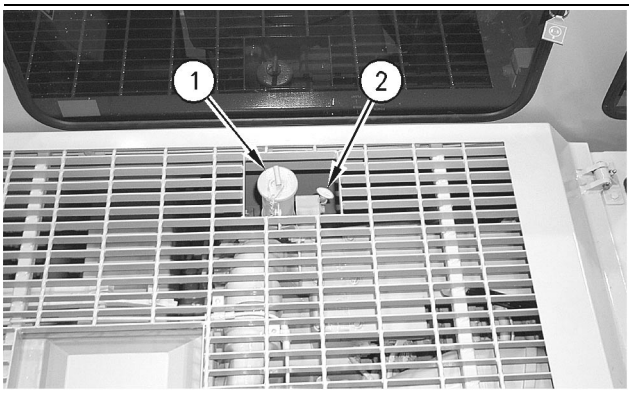

Illustration 256 g00951107

1. Before starting the engine, the oil level must be in the hatched area on the SAFE STARTING RANGE side of dipstick (2).
2. With the engine running and the oil warm, maintain the oil level in the hatched area on the SAFE OPERATING RANGE side of the dipstick.
3. Remove filler cap (1) and add oil if necessary.
4. Clean the filler cap and install the filler cap.

i01865763

Engine Oil and Filter - Change

SMCS Code: 1318-044

Note: Some commercial oils that meet API specifications may require shorter oil change intervals. The oil change intervals are determined by close monitoring of the oil condition and engine wear metals. Caterpillar prefers scheduled oil sampling as the proper method of checking engine wear metals.

Consult your Caterpillar dealer for the latest oil recommendations.

⚠ WARNING

Do not work on or near the cab or left side of the engine until the cab is in the fully tilted position.

Disconnect the batteries by turning the battery disconnect switch to the OFF position and remove the key before performing any service work under the cab.

Accidental cab lowering can cause severe personal injury or death from crushing could occur.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The machine must be level and the parking brake engaged. The oil must be warm and the engine stopped.

Illustration 257 g00951023

The engine oil filters are located on the left side of the engine. Tilt the cab to access the filters.

Reference: For information on tilting the cab, refer to Operation and Maintenance Manual, “Cab - Tilt” for the machine that is being serviced.

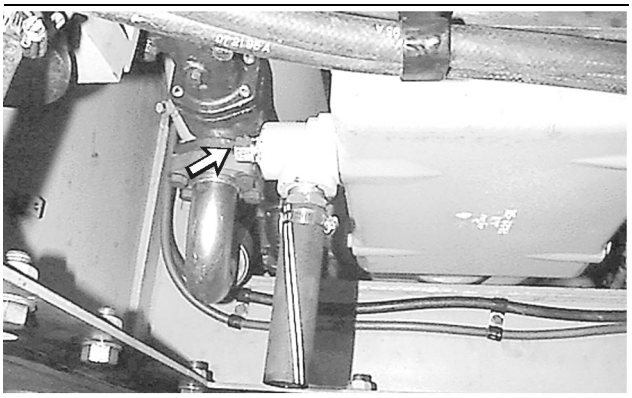

Illustration 258 g00951058

1. Open the drain valve and allow the oil to drain into a suitable container. Close the drain valve.

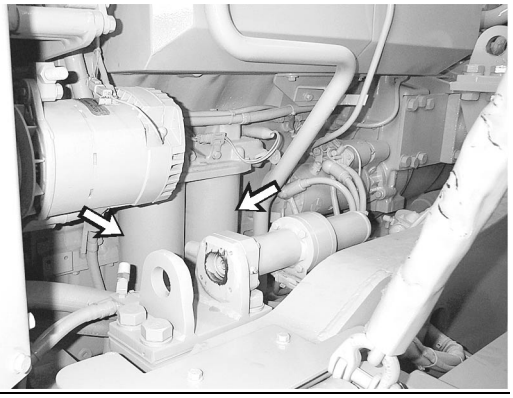

Illustration 259 g00951064

2. Remove the used oil filter elements and discard the used oil filter elements.

3. Clean the filter housing base. Make sure that all of the old seal is removed from the filter base.

4. Apply a thin film of clean engine oil to the new filter element seal.

5. Install both filters hand tight. Tighten the filters until the sealing surface contacts the filter base. Tighten the filter element by an additional 3/4 of a turn.

Note: There are rotation index marks on each filter, spaced 90 degrees (1/4 turn) apart. Use these rotation marks as a guide when tightening the filters.

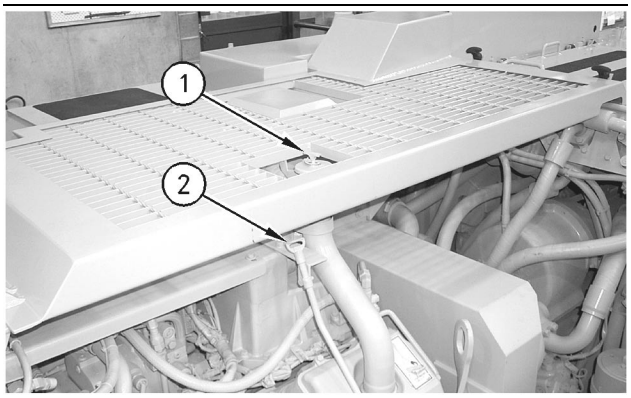

Illustration 260 g00951067

6. Remove filler cap (1). Fill the crankcase with new oil. Clean the filler cap and install the filler cap.

Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

7. Start the engine and run the engine at low idle for five minutes. Inspect the engine oil filter for leaks. Stop the engine.

8. Maintain the oil level in the hatched area on the SAFE OPERATING RANGE side of dipstick (2). Add oil if necessary.

i01866116

Engine Shutdown to Idle Protection System - Test

SMCS Code: 1408-081

1. Start the engine

2. Depress the accelerator pedal to achieve engine rpm above low idle.

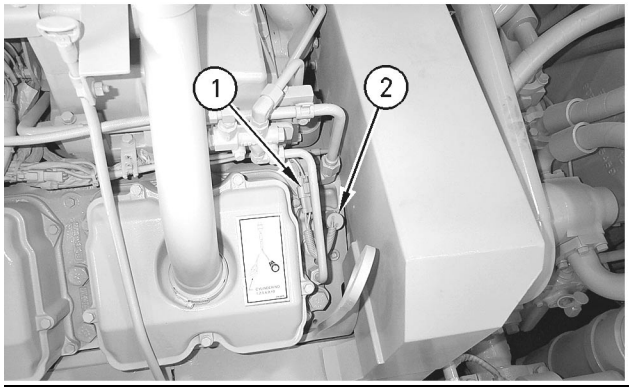

Illustration 261 g00951190

3. Disconnect connector (1) from coolant temperature switch (2). Engine speed should reduce to low idle. Reconnect the wiring at the connector.

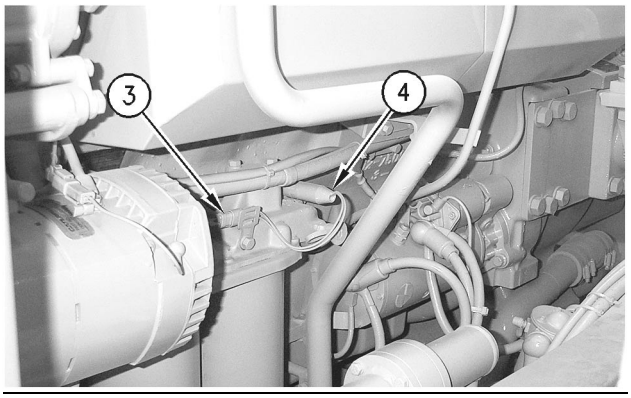

Illustration 262 g00951195

4. Disconnect connector (3) from oil pressure switch (4). Engine speed should reduce to low idle. Reconnect the connector.

5. Stop the engine.

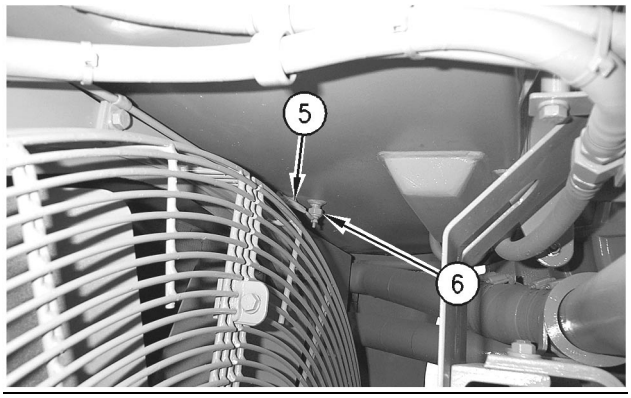

Illustration 263 g00951197

6. Disconnect wire (5) from coolant level sensor (6). Secure the wire to prevent it from touching any metal objects or protruding through the fan guard.

7. Start the engine and depress the accelerator control. Engine speed should not increase above low idle.

8. Stop the engine. Reconnect the wire to the coolant level sensor.

9. Seal wiring connector with electrical corrosion protectant.

10. Replace any cable ties that were removed when disconnecting wiring connectors.

Note: If the engine shutdown to idle protection system does not function correctly, check the electrical system or contact your Caterpillar dealer.

i01866230

Engine Valve Lash - Check/Adjust

SMCS Code: 1102-025; 1102-535

⚠ WARNING

Ensure that the engine can not be started while this maintenance is being performed. To help prevent possible injury, do not use the starting motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting valve lash clearance.

Note: The following warning is located on the valve covers or valve base covers of the engine.

⚠ WARNING

Electrical Shock Hazard. Unit Injector System. 90 - 120 Volts.

Perform the first valve lash check for new engines and rebuilt engines at the first oil change. The initial wear and seating of the valve train components causes this valve lash adjustment to be required.

Subsequent checks of the valve lash and adjustments of the valve lash are scheduled for every 3000 service hours.

Engine valve rotators should also be inspected when the valve lash is checked.

Reference: For information on inspecting the engine valve rotators, refer to Operation and Maintenance Manual , “Engine Valve Rotators - Inspect” for the machine that is being serviced.

NOTICE

Only qualified service personnel should perform this maintenance. Refer to the Service Manual or your Caterpillar dealer for the complete valve lash adjustment procedure.

Operation of Caterpillar engines with improper valve adjustments can reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

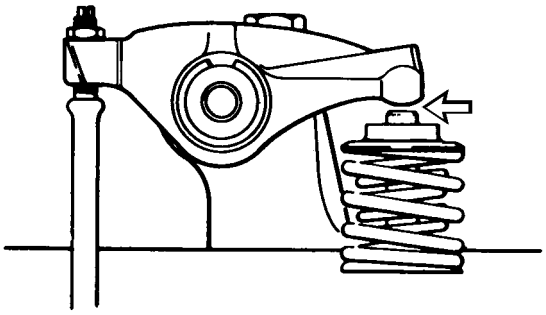

Illustration 264 g00951266

If the valve clearance is within 0.08 mm (0.003 inch) of nominal clearance given, adjustment is not required. If the clearance is not within these limits, set the clearance as specified in table 14.

Table 14

Valve Clearance Setting	
Intake	0.38 mm (0.015 inch)
Exhaust	0.76 mm (0.030 inch)

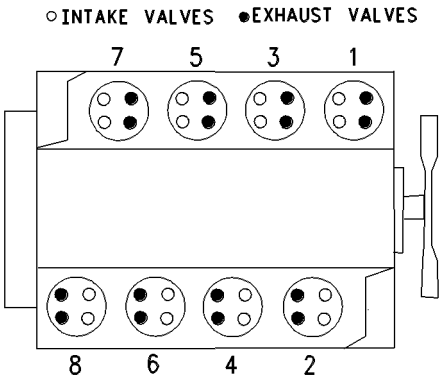

Illustration 265 g00951267

Reference: For further information on checking the engine valve lash, refer to Systems Operation, Testing and Adjusting, “3408E & 3412E Engines” for the machine that is being serviced. Contact your Caterpillar dealer for additional information.

i01770623

Engine Valve Rotators - Inspect

SMCS Code: 1109-040

⚠ WARNING

When inspecting the valve rotators, protective glasses or face shield and protective clothing must be worn, to help prevent being burned by hot oil or spray.

NOTICE

A valve rotator which does not operate properly will accelerate valve face wear and valve seat wear and shorten valve life. If a damaged rotator is not replaced, valve face guttering could result and cause pieces of the valve to fall into the cylinder. This can cause piston and cylinder head damage.

Valve rotators cause the valve to rotate when the engine runs. This helps to prevent deposits from building up on the valve and the valve seats.

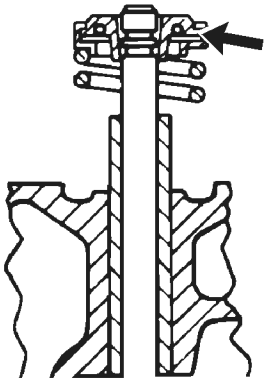

Illustration 266 g00905744

Perform the following steps after the valve lash is set, but before the valve covers are installed:

1. Start the engine. Operate the engine at low idle
2. Observe the top surface of each valve rotator. The valve rotators should turn slightly when the valves close.

If the valve fails to rotate, contact your Caterpillar dealer.

i01866298

Engine Water Pump - Inspect

SMCS Code: 1361-040

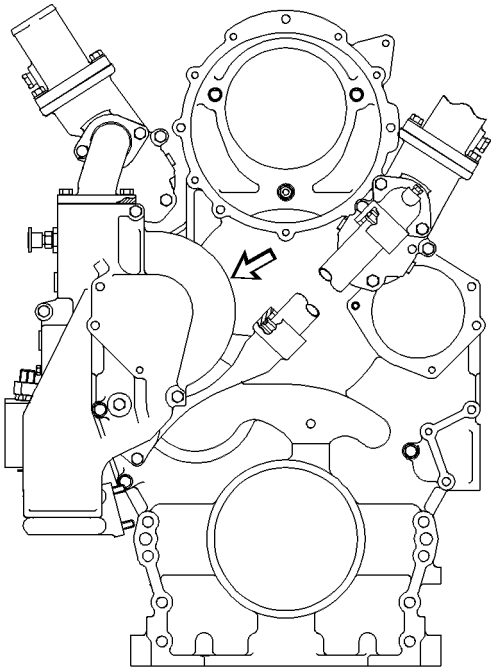

Illustration 267 g00951327

Front view of engine

A water pump that has failed may cause severe engine overheating problems. The engine overheating problems could result in the following problems:

- Cracks in the cylinder head.
- Piston seizure.
- Other potential engine damage.

Visually inspect the water pump for leaks. If leaks are found, all of the seals on the water pump must be replaced.

Note: For further information, refer to Disassembly and Assembly, “3408E & 3412E Engine” for the machine that is being serviced.

i01866342

Exhaust Purifier - Inspect/Clean

SMCS Code: 1089-040; 1089-070

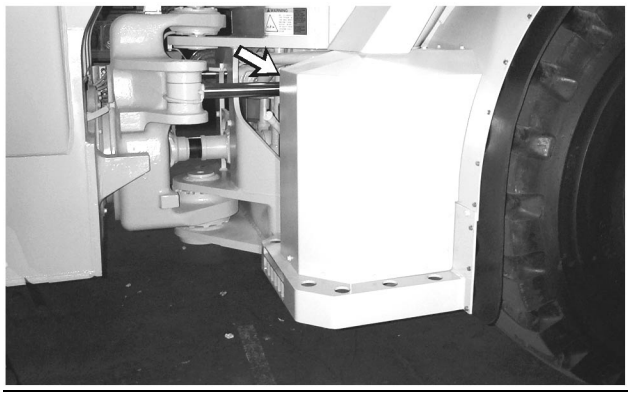

Illustration 268 g00951352

Inspect the catalytic purifier for damage and for leaks. If necessary, make repairs. If the catalytic purifier is damaged, consult your Caterpillar dealer.

If the engine has low power, the catalytic purifier may be blocked. Clean the catalytic purifier.

Reference: For information on cleaning the catalytic purifier, refer to the Operation and Maintenance Manual, “Emission Control Systems” for the machine that is being serviced.

i01866399

Fan Drive Bearing and Belt Tightener - Lubricate

SMCS Code: 1358-086; 1359-086-BD

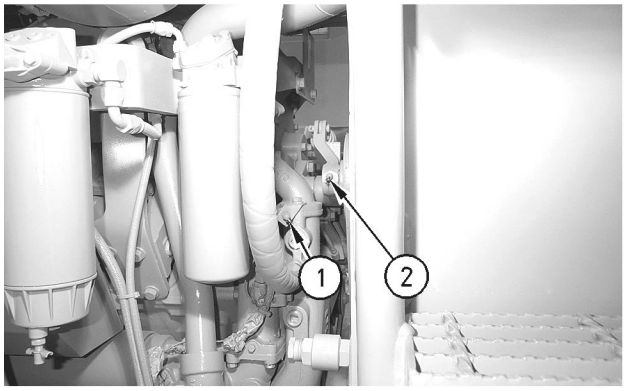

Illustration 269 g00951357

1. Lubricate the fan drive bearing through fitting (1).

2. Lubricate the belt tightener pulley through fitting (2).

Note: If regular lubrication is performed at the recommended interval, only two or three shots of lubricant will be required.

i01866430

Fire Suppression System - Check

SMCS Code: 7401-535

Reference: For detailed information on the fire suppression system service procedures, refer to the fire system manufacturer’s service information.

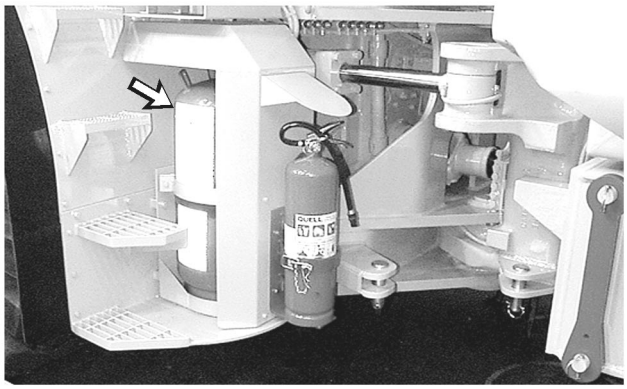

Illustration 270 g00951410

Foam type fire suppression system

Perform fire suppression system checks and service procedures in accordance with the fire suppression system manufacturer’s service information.

i01866667

Frame and Body - Inspect

SMCS Code: 7051-040; 7258-040

AD45

⚠ WARNING

The body (bed) may fall unexpectedly and without warning resulting in personal injury or death.

When it is necessary to work under the truck with the body (bed) raised, install the body (bed) retaining pins through the pin bores in the frame and body.

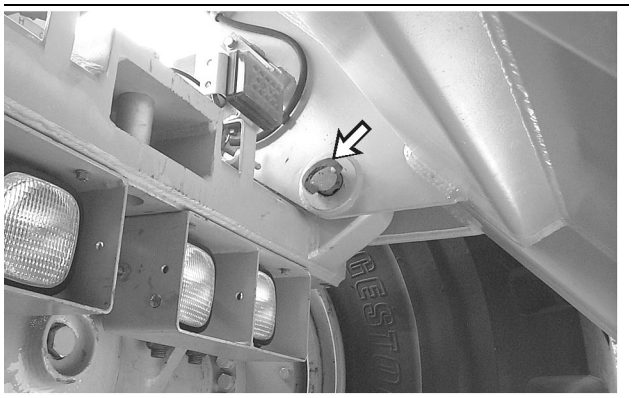

Illustration 271 g00951543

1. Raise the dump body until the pin bores on the dump body align with the pin bores on the frame. Install the two body retaining pins.

Illustration 272 g00951544

2. Inspect the dump body. If the dump body is damaged or worn, repair the dump body.

3. Clean the frame with a wire brush or a scraper. If you find cracks or damage, contact your Caterpillar dealer for the specific repair procedures.

4. Remove the body retaining pin. If the pin cannot be removed, raise the dump body to release the tension. Place the pin in the stored position in the rear frame.

AE40 Series II

⚠ WARNING

The tailgate may move suddenly and without warning, resulting in personal injury or death.

When it is necessary to work under the tailgate with the tailgate raised, install the tailgate retaining pins through the pin bores in the tailgate and body.

Illustration 273 g00943713

1. Fully retract the ejector plate and raise the tailgate until the pin bores on the body align with the pin bores on the tailgate. Install the tailgate retaining pin.

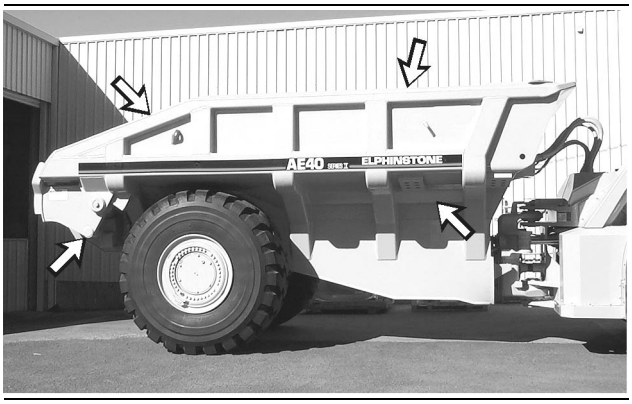

Illustration 274 g00951548

2. Clean the ejector body with a wire brush or a scraper. Inspect the ejector body. If the body is damaged or worn, repair the body. If you find cracks, contact your Caterpillar dealer for the specific repair procedure.

3. Remove the tailgate retaining pin. If the pin cannot be removed, raise the tailgate to release the tension. After lowering the tailgate, place the pin in the stored position in the body.

i01866693

Frame and Body Support Pads - Clean/Inspect

SMCS Code: 7051-040; 7051-070; 7258-040; 7258-070

AD45

⚠ WARNING

To prevent personal injury or death, do not work under the truck with the body (bed) raised.

When it is necessary to work under the truck with the body (bed) raised, install the body (bed) retaining pins through the pin holes in the frame and body.

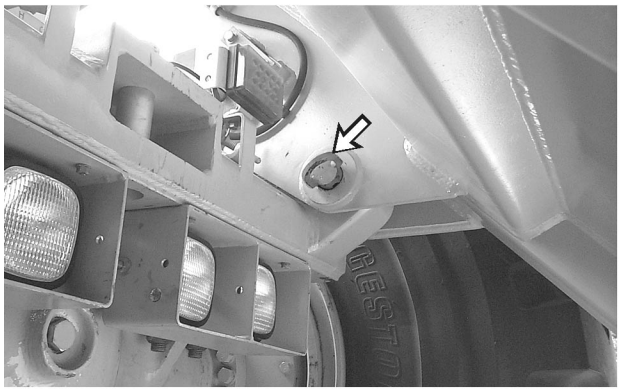

Illustration 275 g00951543

1. Raise the dump body until the retaining bores on the dump body align with the retaining bores on the frame. Install the two body retaining pins.

Illustration 276 g00951578

2. Clean the body support pads with high pressure water or steam. If damage is found, contact your Caterpillar dealer for the specific repair procedure.
3. Visually inspect each of the body support pads. Look for uneven wear of the body support pads. Look for gaps between the body support pads and the mating surfaces. If problems are found contact your Caterpillar dealer for additional information.
4. Remove the body retaining pins. If the pins cannot be removed, raise the dump body to release the tension. After lowering the dump body, place the pins in the stored position in the dump body.

i01866816

Fuel System - Prime

SMCS Code: 1250-548

After changing the fuel filters or if the engine fuel system is run dry, prime (purge) the fuel system to fill filters and remove air bubbles from the system.

NOTICE

Do not loosen the fuel lines at the fuel manifold. The engine components may be damaged.

Do not remove the fitting in the fuel filter base in order to release air from the fuel system while priming the engine. Periodic removal of the fitting will result in increased wear of the threads in the fuel filter base and will lead to fuel leakage.

Do not allow dirt to enter the fuel system. Thoroughly clean the area around any fuel system component that will be disconnected. Fit a suitable cover over any disconnected fuel system component in order to protect it from dirt and debris.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 277 g00951618

1. Turn the priming pump counterclockwise and pull out the priming pump plunger. This will unlock the hand priming pump.

2. Use the hand priming pump to fill the engine fuel lines with fuel. Continue to prime the fuel system until the pump resists operation.

3. Start the engine and inspect the fuel system for leaks.

4. If the engine will not start or continues to misfire or smoke, further priming is necessary.

Note: The engine ECM is cooled by fuel. It may be necessary to block the fuel from flowing through the ECM during priming in order to force the fuel to flow to the injectors.

5. Push the priming pump plunger inward and turn the priming pump plunger clockwise. This will lock the priming pump plunger.

i01867384

Fuel System Primary Filter - Clean/Replace

SMCS Code: 1260-070; 1260-510

Clean the primary element when the engine has a loss of power or when the exhaust smoke is black.

⚠ WARNING

Personal injury or death can result if spilled fuel ignites. Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

To help prevent possible injury, turn the battery disconnect switch to the OFF position when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not fill fuel filters with fuel before installing them. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts. The fuel system should be primed prior to starting the engine.

Illustration 278 g00951651

1. Remove the fuel filter assembly from the base with a strap-type wrench.

2. Remove the water separator bowl and seal from the filter element and discard the used filter. Inspect the seal. If the seal is damaged, use a new one.

3. Clean the filter mounting base. Be sure all of the old seal is removed.

4. Wash the water separator bowl in clean, nonflammable solvent.

5. Lubricate the seals of a new filter with clean diesel fuel.

6. Install the seal and the water separator bowl on the new primary filter element.

7. Install the filter assembly by hand. When the seal contacts the base, tighten 3/4 of a turn more.

8. Prime the fuel system.

   Reference: For information on priming the fuel system, refer to the Operation and Maintenance Manual, “Fuel System - Prime” for the machine that is being serviced.

9. Start the engine and inspect the filter for leaks. Make any necessary repairs. If the engine has a loss of power or the exhaust smoke is still black, replace the secondary filter.

Reference: For information on replacing the secondary fuel filter, refer to the Operation and Maintenance Manual, “Fuel System Secondary Filter - Replace” for the machine that is being serviced.

i01867519

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510-SE

⚠ WARNING

Personal injury or death can result if spilled fuel ignites. Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

To help prevent possible injury, turn the battery disconnect switch to the OFF position when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not fill fuel filters with fuel before installing them. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts. The fuel system should be primed prior to starting the engine.

Illustration 279 g00951660

1. Remove the fuel filter element with a strap-type wrench. Discard the used filter.

2. Clean the filter housing base. Make sure that all of the old seal is removed.

3. Lubricate the sealing surface of the new filter element with clean diesel fuel.

4. Install the new filter by hand. Tighten the filter element until the sealing surface contacts the base. Tighten the filter element an additional 3/4 of a turn.

Note: There are rotation index marks on each filter, spaced 90 degrees (1/4 turn) apart. Use these marks as a guide when tightening the filter.

5. Prime the fuel system.

   Reference: For information on priming the fuel system, refer to the Operation and Maintenance Manual, “Fuel System - Prime” for the machine that is being serviced.

6. Start the engine and inspect the filter for leaks. Make any necessary repairs.

i01867663

Fuel System Water Separator - Drain

SMCS Code: 1263-543

Note: The water separator is not a filter. The water separator separates the water from the fuel.

⚠ WARNING

Personal injury or death can result if spilled fuel ignites. Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

To help prevent possible injury, turn the battery disconnect switch to the OFF position when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 280 g00951669

1. Open the drain valve and allow the water and sediment to drain into a suitable container.
2. Close the drain valve.

i01867731

Fuel Tank Cap and Strainer - Clean

SMCS Code: 1273-070-STR; 1273-070-Z2

Note: Machines equipped with an optional fast-fill fuel system do not contain a breather filter element in the fuel cap. Perform Steps 3 and 5 only to standard machines without the fast-fill fuel system.

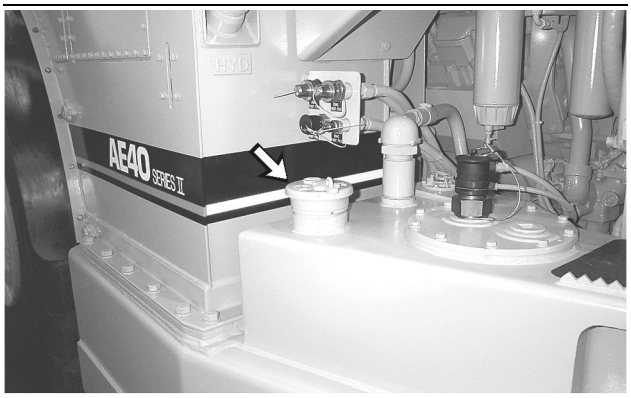

Illustration 281 g00951678

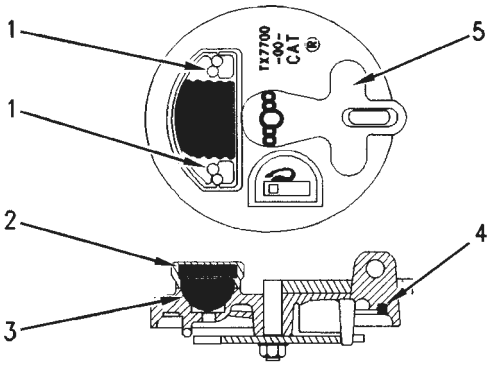

Illustration 282 g00906284

1. Lift lever (5) and turn the lever counterclockwise until the lever stops. Lift the cap straight up to remove the cap.
2. Inspect seal (4) for damage. Replace the seal, if necessary.
3. Remove screws (1), filter assembly (2), valve (3) and gaskets.
4. Wash the cap in a clean, nonflammable solvent.
5. Install a new filter kit in the cap. Install the components in reverse order.

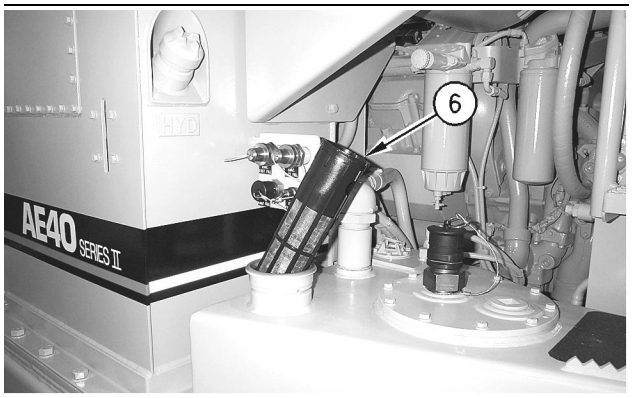

Illustration 283 g00951679

6. Remove strainer (6) from the filler opening.

7. Wash the strainer in a clean, nonflammable solvent.

8. Install strainer (6) in the filler opening.

9. Install the fuel tank cap.

i01867877

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 284 g00951692

The drain valve is located on the right side of the machine under the fuel tank.

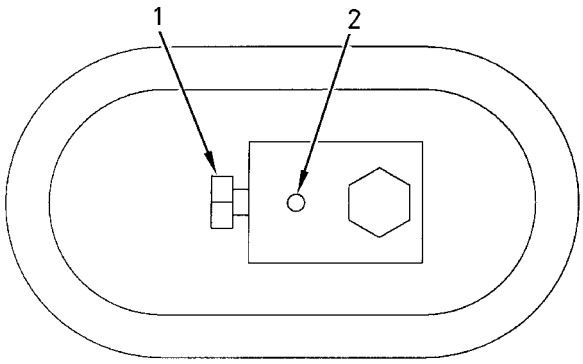

Illustration 285 g00951696

1. Open (turn counterclockwise) drain valve (1) and allow the water and sediment to drain out of opening (2) into a suitable container.

2. Close drain valve (1).

i01868070

Fuses - Replace

SMCS Code: 1417-510

Fuses – Fuses protect the electrical system from damage caused by overloaded circuits. Replace the fuse if the element separates. If the element of a new fuse separates, check the circuit. Repair the circuit, if necessary.

NOTICE
Replace the fuses with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical problem may exist. Contact your Caterpillar dealer

Illustration 286 g00951770

View of battery compartment under the operator's station

(1) 675 Amp - Fusible link.

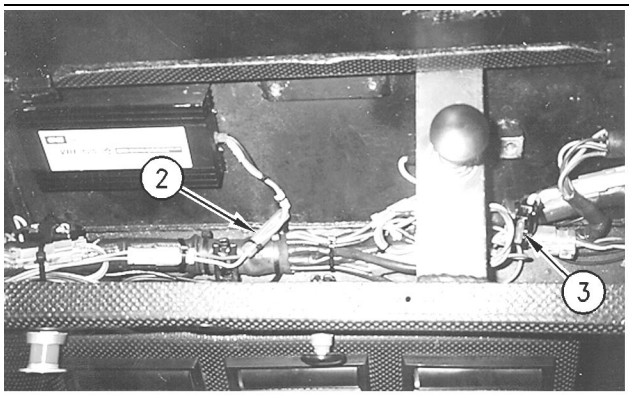

Illustration 287 g00951772

View under right side of console cover in the operator's station

(2) 8 Amp (if equipped) - voltage reducer

(3) 5 Amp - Torque converter lock-up

i01868381

Hoist Cylinder Bearings - Lubricate

SMCS Code: 7551-086-CD

NOTICE

Check that the lines attached to all remote grease fittings are undamaged. If the lines are split, grease will not reach the bearings or pins. Machine damage will result.

Wipe all fittings clean before lubricating.

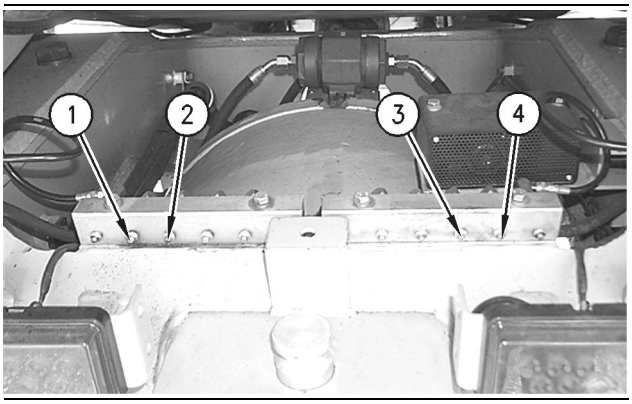

Illustration 288 g00951840

Rear view of the AD45 machine

1. Lubricate the left upper hoist cylinder bearing through remote mounted fitting (1).
2. Lubricate the left lower hoist cylinder bearing through remote mounted fitting (2).
3. Lubricate the right lower hoist cylinder bearing through remote mounted fitting (3).
4. Lubricate the right upper hoist cylinder bearing through remote mounted fitting (4).

i01868836

Hoist, Torque Converter and Brake Oil - Change

SMCS Code: 5050-044

Operate the machine long enough to warm the oil.

The machine must be level, the parking brake engaged and the engine stopped.

1. Remove the filler cap to prevent a vacuum in the tank. Install the cap after the tank is drained to prevent dirt from entering the system.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Illustration 289 g00951917

Note: Hand tighten the NPT pipe nipple. Do not use tools.

2. Remove the tank drain plug. Open the drain valve by installing a 1 inch NPT pipe nipple, 88 mm (3.50 inch) long, in the bottom of the tank, to open the internal drain valve and drain the oil. Drain the oil into a suitable container.

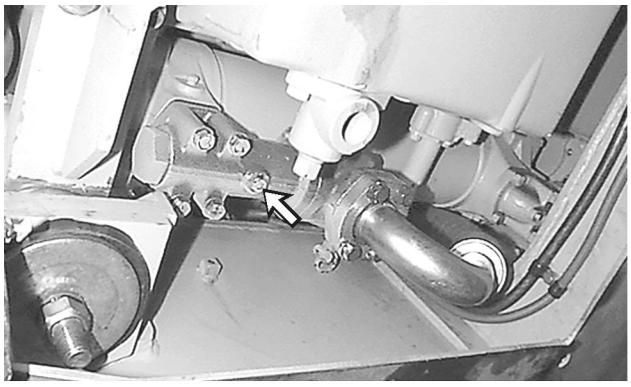

Illustration 290 g00951920

3. Remove the drain plug from the brake oil cooler and drain the oil. Drain the oil into a suitable container. Clean and install the plug.

4. Remove the pipe nipple. Clean and install the tank drain plug.

5. Remove the hoist, torque converter and brake hydraulic tank filler cap.

6. Remove the strainer.

7. Wash the cap and the strainer in clean, nonflammable solvent. Allow them to dry.

8. Inspect the cap seal. Use a new seal if the used one is damaged. Install the strainer.

9. Fill the hoist, torque converter and brake hydraulic tank.

Reference: For information on lubricants and refill capacities, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

10. Start the engine and run the engine at low idle. Check for leaks.

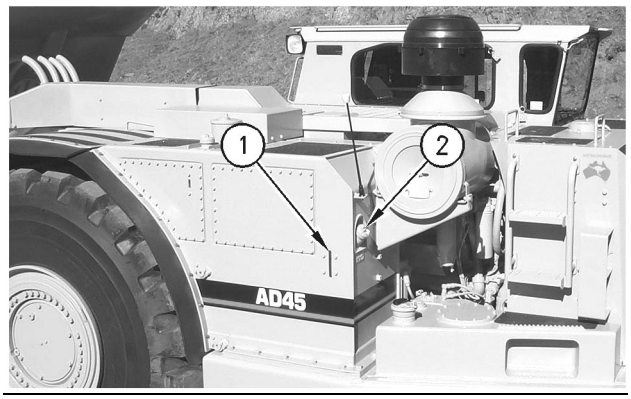

Illustration 291 g00951948

11. With the oil cold, check the oil level in sight gauge (1). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

12. Maintain the oil level to the FULL mark in the sight gauge.

13. Remove filler cap (2) add oil if necessary.

i01868920

Hoist, Torque Converter and Brake Oil Level - Check

SMCS Code: 5050-535-FLV

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

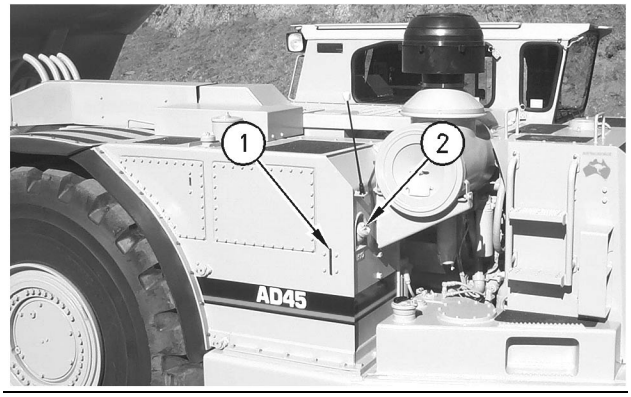

Illustration 292 g00951948

NOTICE

Ensure the dump body is fully lowered (AD45) or the ejector plate is fully retracted and the tailgate fully raised (AE40 Series II) when checking the tank oil level.

The hoist, torque converter and brake hydraulic tank is located on the right side of the machine.

1. With the oil cold, check the oil level in sight gauge (1). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.
2. Maintain the oil level to the FULL mark in the sight gauge.
3. Remove filler cap (2) add oil if necessary.
4. Clean the filler cap and install the filler cap.

Note: If the system has been drained, it will be necessary to stop the engine and add oil several times.

i01874943

Hoist, Torque Converter and Brake Tank Breather - Replace

SMCS Code: 5057

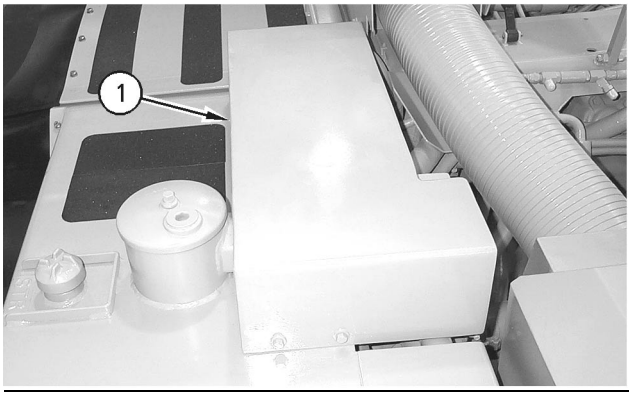

Illustration 293 g00954327

1. Remove cover (1).

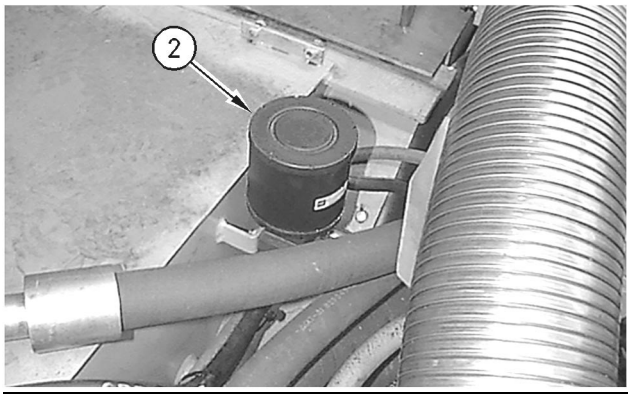

Illustration 294 g00954328

2. Loosen the retaining clamp on the bottom of breather element (2). Remove and discard the used breather element.
3. Install the new breather element. Tighten the retaining clamp.
4. Install cover (1).

i01868954

Hoist, Torque Converter and Brake Tank Screen - Clean

SMCS Code: 5056-070-Z3

There is one return screen and two suction screens inside the hoist, torque converter and brake tank.

Clean the return screen and suction screens whenever there is a failure of the brakes, torque converter, hoist/eject cylinders or hoist pumps.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

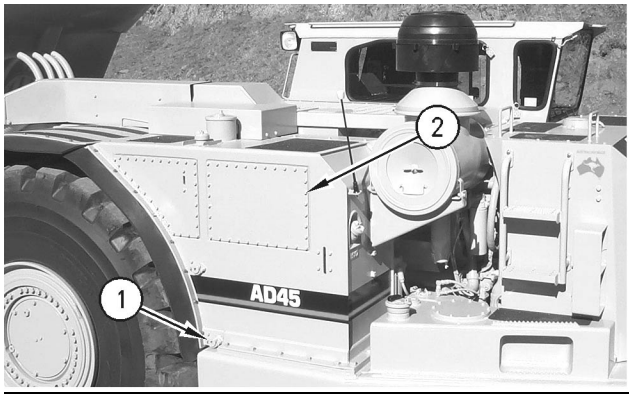

Illustration 295 g00993169

Note: Hand tighten the NPT pipe nipple. Do not use tools.

1. Remove the tank drain plug. Open the drain valve by installing a 1 inch NPT pipe nipple, 88 mm (3.50 inch) long, in the bottom of the tank, to open the internal drain valve and drain the oil. Drain the oil into a suitable container.
2. Remove bolts (2) from the hydraulic tank cover and remove the cover.
3. Clean the debris from the bottom of the tank.

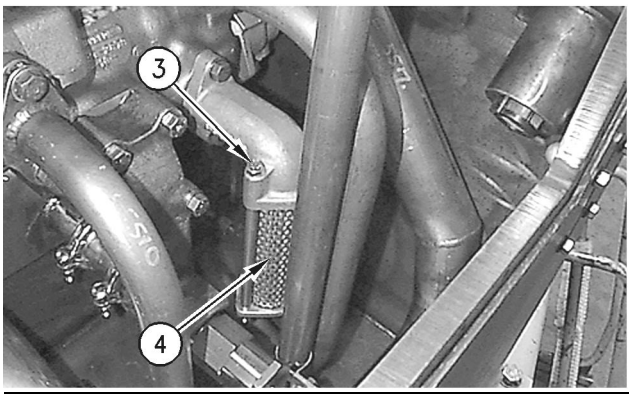

Illustration 296 g00952019

4. Remove the retaining nuts from bolts (3). Remove the cover located at the bottom of hoist return screen (4). Remove and clean or discard the screen.
5. Install new or clean screen (4), the screen cover and cover retaining nuts.
6. Clean the hydraulic tank cover in clean, nonflammable solvent. Inspect the cover gasket. If the gasket is damaged, use a new gasket.

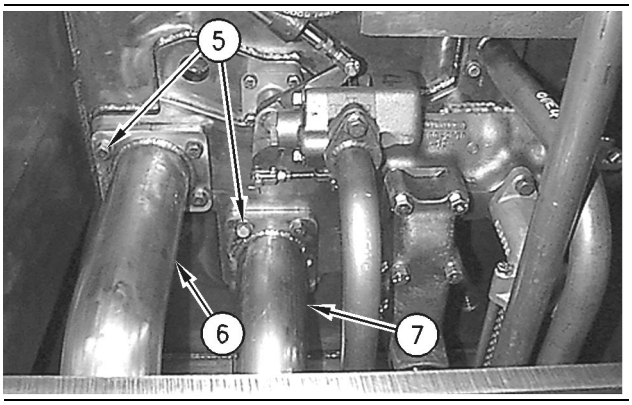

Illustration 297 g00952025

7. Remove four bolts (5) that hold suction pipes (6) and (7) to the hydraulic tank. Remove the suction pipe, seal and screen assemblies.
8. Remove the suction screens from the pipes.
9. Wash the screens in clean, nonflammable solvent.
10. Inspect the suction pipe seals. Replace if damaged.

11. Inspect the suction screens in the pipe assemblies.

12. Install the suction pipe, screen and seal assemblies in the hydraulic tank. Secure the pipes to the hydraulic tank with bolts (5).

13. Install the tank cover and bolts.

14. Fill the hydraulic tank.

Reference: For information on lubricants and refill capacities, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

15. Start the engine and run the engine at low idle. Check for leaks.

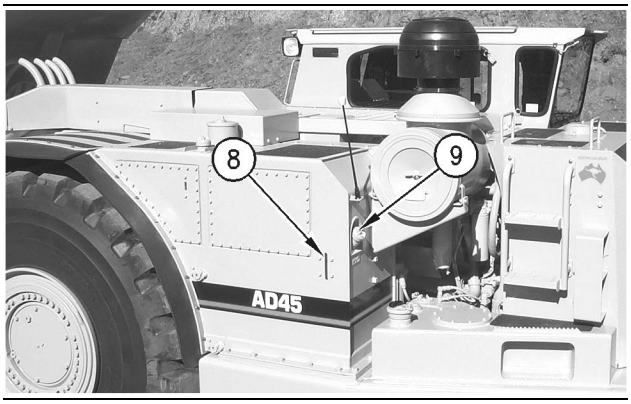

Illustration 298 g00952032

16. With the oil cold, check the oil level in sight gauge (8). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

17. Maintain the oil level to the FULL mark in the sight gauge.

18. Remove filler cap (9) and add oil if necessary.

i01869547

Indicators and Gauges - Test

SMCS Code: 7000-081; 7450-081

Before you operate the machine, perform the following checks and make any necessary repairs:

- Look for broken lenses on the gauges. Also, look for broken indicator lights, broken switches and other broken components in the operator’s station.
- Move the engine start switch key to the ON position and check the Caterpillar Monitoring System self test.

Reference: For information on the Caterpillar Monitoring System self test, refer to the Operation and Maintenance Manual, “Caterpillar Monitoring System - Self Test” for the machine that is being serviced.

- Make sure the parking brake is engaged. Start the engine.
- Check for oil leaks. Repair any oil leaks around the covers or around the hoses.
- Look for inoperative gauges.
- Turn on all machine lights. Check for proper operation.
- Sound the horn.
- Stop the engine.

i01773398

Oil Filter - Inspect

SMCS Code: 1308-507; 3067-507; 5068-507

Inspect a Used Filter for Debris

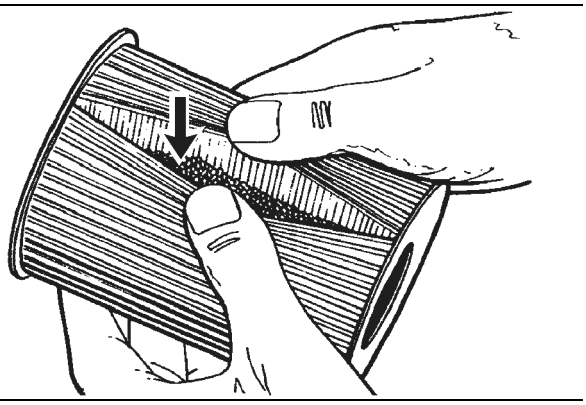

Illustration 299 g00907074

The Element is Shown with Debris

Use a **4C-5084** Filter Cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminium parts of the engine, such as main bearings, rod bearings or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i01869668

Oscillating Hitch - Adjust

SMCS Code: 7113-025

Illustration 300 g00952100

Adjust the oscillating hitch bearing preload at the initial 250 Service Hours or 1 month service interval and then at every 1000 service hours or 6 monthly service interval.

Reference: For the correct oscillating hitch bearing adjustment procedures, refer to Steering Systems, Specifications, “Oscillating Hitch” for the machine that is being serviced or contact your Caterpillar dealer.

i01869706

Oscillating Hitch - Lubricate

SMCS Code: 7113-086

NOTICE
Check that the lines attached to all remote grease fittings are undamaged. If the lines are split, grease will not reach the bearings or pins. Machine damage will result.

Wipe all fittings clean before lubricating.

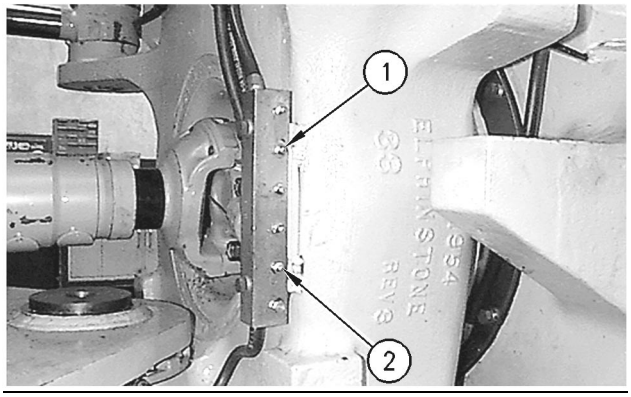

Illustration 301 g00952133

1. Lubricate the upper hitch bearing through remote mounted fitting (1).

2. Lubricate the lower hitch bearing through remote mounted fitting (2).

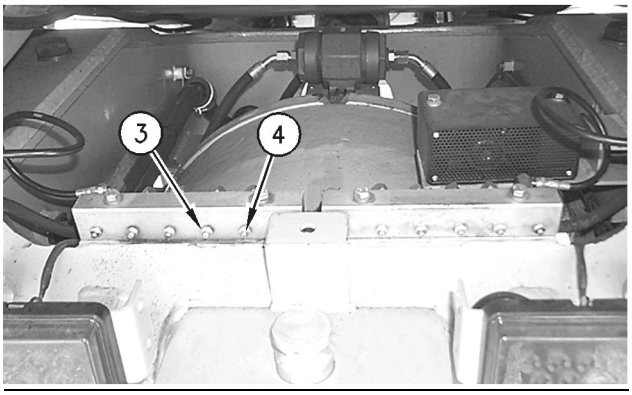

Illustration 302 g00952140
Rear view of AD45 machine

3. Lubricate the front oscillation bearing through remote mounted fitting (3).

4. Lubricate the rear oscillation bearing through remote mounted fitting (4).

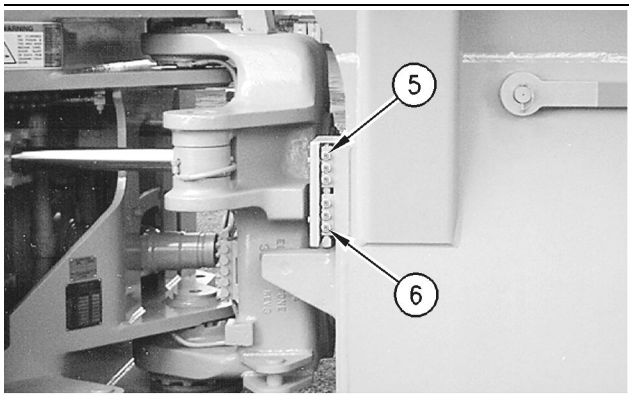

Illustration 303 g00952146

Left side view of AE40 Series II machine

5. Lubricate the rear oscillation bearing through remote mounted fitting (5).

6. Lubricate the front oscillation bearing through remote mounted fitting (6).

i01869854

Parking Brake Release Oil Filter - Replace

SMCS Code: 4267-510-FI

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

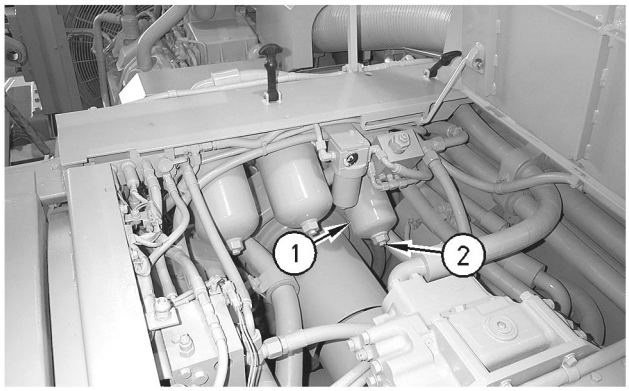

Illustration 304 g00952181

1. Remove drain plug (2) from the bottom of filter housing (1). Drain the oil into a suitable container. Install drain plug (2) in the filler housing and tighten finger tight.

Note: Removing drain plug from the bottom of filter housing may not drain all of the oil from the filter. Avoid spillage when removing the filter housing and filter element.

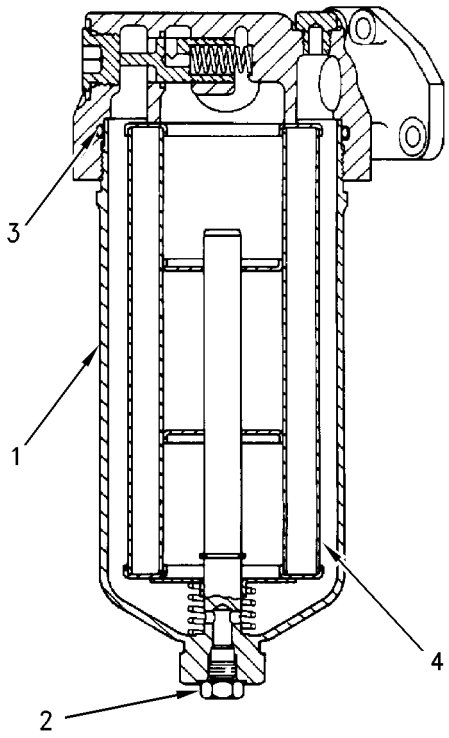

Illustration 305 g00952184

2. Remove filter housing (1) and filter element (4). Discard the used filter element.

3. Remove drain plug (2) from the filter housing. Wash the drain plug and filter housing in clean, nonflammable solvent. Install the filter housing drain plug.

4. Inspect seal (3) in the filter base. If the seal is damaged, replace the seal with a new seal.

5. Install the new element in the filter housing. Install the filter housing and element.

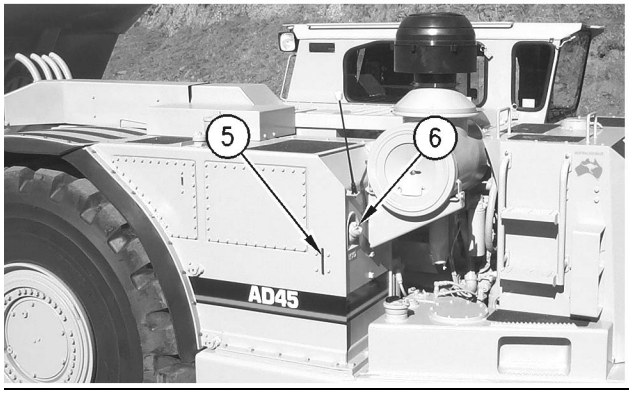

Illustration 306 g00952191

6. Start the engine and operate the engine at low idle. Check for leaks.

7. With the oil cold, check the oil level in sight gauge (5). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

8. Maintain the oil level to the FULL mark in sight gauge (5).

9. Remove filler cap (6) and add oil if necessary.

i01869990

Radiator Core - Clean

SMCS Code: 1353-070-KO

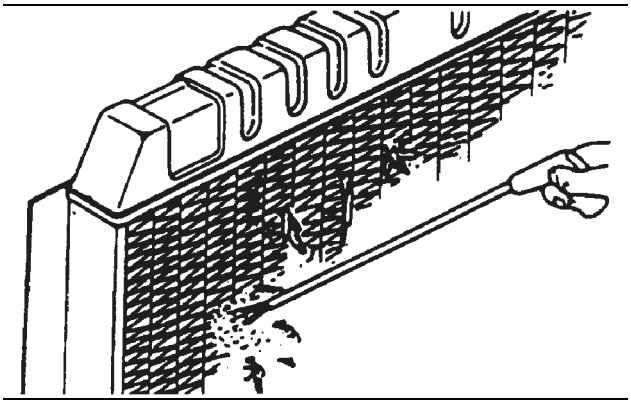

Illustration 307 g00907092

You can use compressed air, high pressure water or steam to remove dust and other debris from the radiator core. However, the use of compressed air is preferred.

Care must be taken when you are using high pressure water. High pressure water can cause damage to the radiator. Using a water spray nozzle on the pressure washer which will disperse the water pressure is preferred.

Reference: For the complete procedure for cleaning the radiator core, refer to Special Publication, SEBD0518, “Know Your Cooling System” for the machine that is being serviced.

i01870049

Rollover Protective Structure (ROPS) and Falling Object Protective Structure (FOPS) - Inspect

SMCS Code: 7325-040

NOTICE
Do not attempt to straighten the ROPS structure. Do not repair the ROPS by welding reinforcement plates to the structure.

If there are any cracks in the welds, in the castings, or in any metal section of the ROPS, consult your Caterpillar dealer for repairs.

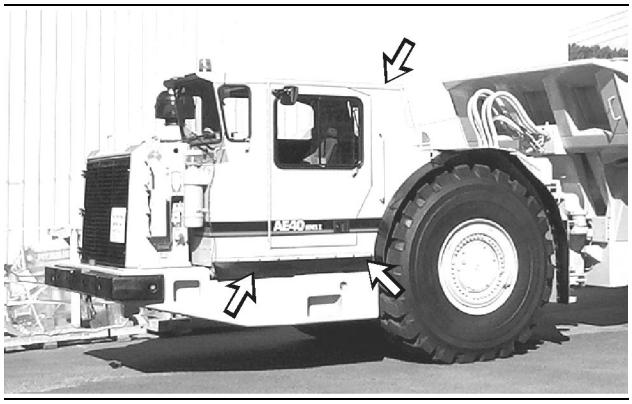

Illustration 308 g00952272

Inspect the ROPS/FOPS for bolts that are loose or damaged. Use original equipment parts only to replace bolts that are damaged or missing. Tighten the mounting bolts to the correct torque.

Reference: For the correct bolt torques, refer to the Power Train, Specifications, “Cab Mounting (FOPS) or Cab Mounting (ROPS)” for the machine that is being serviced.

Note: Apply thread lubricant to all ROPS/FOPS bolt threads before installation. Failure to apply lubricant can result in improper bolt torque.

Replace ROPS/FOPS mounting supports if the ROPS/FOPS rattles or makes a noise when the machine is operated on a rough surface.

Check cab lockdown pins for wear and serviceability. Lubricate the cab pivot pins.

Check for full extension and retraction of the cab lockdown pins. Check for correct cab tilt sequence. Check for leaks from lockdown pin hydraulic cylinders.

Do not repair the ROPS/FOPS by welding reinforcement plates to the ROPS/FOPS. Consult your Caterpillar dealer for repair of cracks in any welds, in any castings, or any metal section of the ROPS/FOPS.

Ensure any certification labels are firmly fixed and legible.

i01773416

Seat Belt - Inspect

SMCS Code: 7327-040

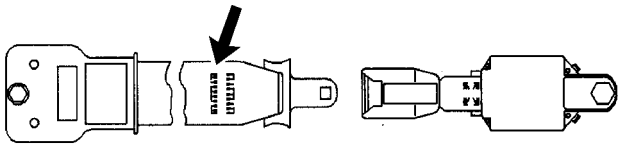

Illustration 309 g00907536

Always check the condition of the seat belt and the condition of the belt mounting hardware before you operate the machine.

Inspect the seat belt for worn or frayed webbing.

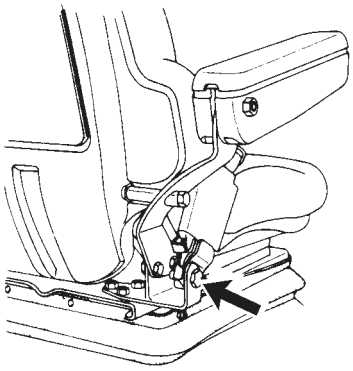

Illustration 310 g00907537

Inspect the belt mounting hardware. Replace any belt mounting hardware that is worn or damaged. Keep the mounting bolts tight.

Regardless of the appearance, replace the seat belt once during every three year interval.

i01773427

Seat Belt - Replace

SMCS Code: 7327-510

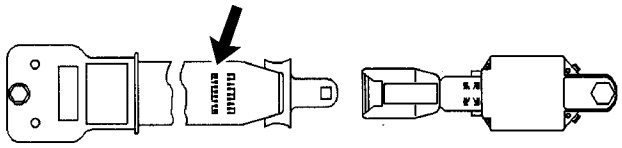

Illustration 311 g00907536

Regardless of the appearance of the seat belt, the seat belt should be replaced at every three year interval. A date label is attached to each seat belt. Use this label in order to determine the age of the seat belt.

Consult your Caterpillar dealer for replacement of the seat belt.

i01870130

Service Inspection

SMCS Code: 7000

For maximum service life of the machine, make a thorough service inspection when you perform lubrication and maintenance work. Look around the machine and under the machine. Inspect the condition of all major components. Check all grease fittings. Look for the following discrepancies:

- loose bolts
- trash buildup
- oil, coolant, or fuel leaks
- broken parts or worn parts
- cracks in the frames

Remove any trash and any debris. As needed, adjust the tire inflation. Make any necessary repairs. Make sure that all loose connections and all parts are tightened to the specified torques. Replace any missing parts before starting the engine or before operating the machine.

Inspect the machine for leaks. If leaks are observed, find the source of the leak and correct the leak. If leaks are suspected, check the fluid levels more frequently than the recommended intervals.

AD45

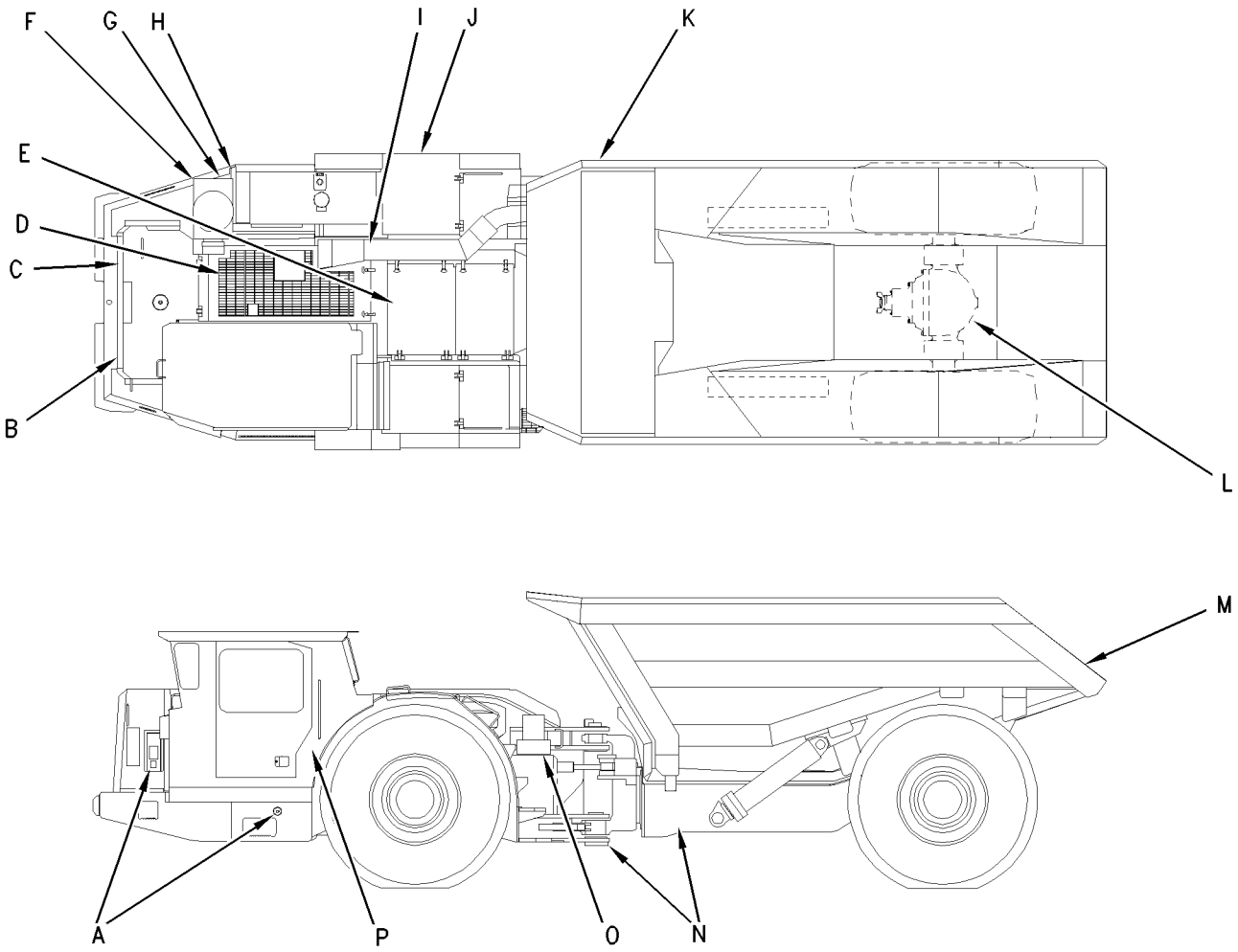

Illustration 312 g00952317

Inspection points for the service inspection

(A) Ground level controls
(B) Front lights
(C) Cooling system
(D) Engine
(E) Power train hydraulic system
(F) Air cleaner
(G) Fuel tank
(H) Hydraulic system
(I) Front suspension cylinders
(J) Tires
(K) Steering hydraulic system
(L) Rear axle
(M) Frame and body
(N) Articulating hitch and oscillating hitch
(O) Automatic lubrication system (if equipped)
(P) Rollover Protective Structure (ROPS) and Falling Object Protective Structure (FOPS)

Illustration 313 g00943874

(A) Inspect the ground level controls for proper operation. Replace a damaged or worn engine shutdown switch (1). Replace a damaged or worn battery disconnect switch (2).

(B) Inspect the lights for broken lamps, lenses and proper operation. Replace broken lamps and lenses.

(C) Inspect the cooling system for leaks, worn hoses and debris. Repair any leaks and damaged hoses. Remove any debris that could block the air flow through the radiator.

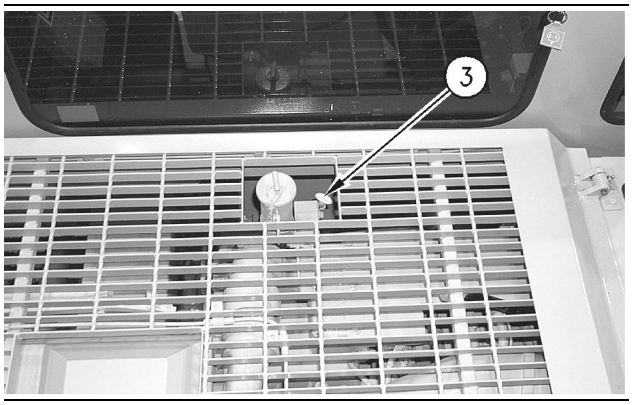

Illustration 314 g00943815

(D) Inspect the engine. Use dipstick (3) to check the engine oil level. Check for oil leaks, coolant leaks, and exhaust leaks. Check the belts of the engine for proper tension and for good condition. Check the level in the washer fluid bottle.

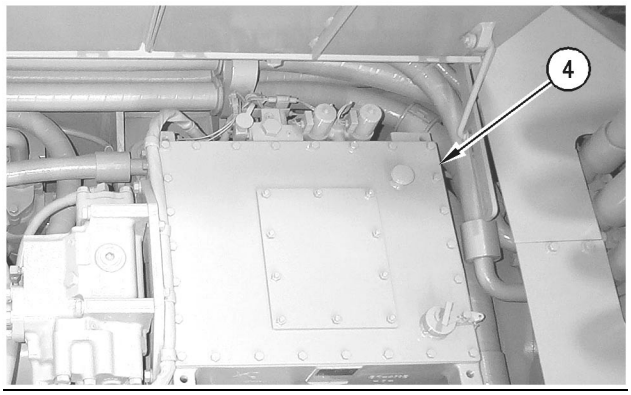

Illustration 315 g00952402

(E) Inspect the hydraulic system for the torque converter and transmission (4). Check for leaks from the torque converter and from the transmission. Check for worn hoses and for damaged lines. Repair any leaks, worn hoses and damaged lines.

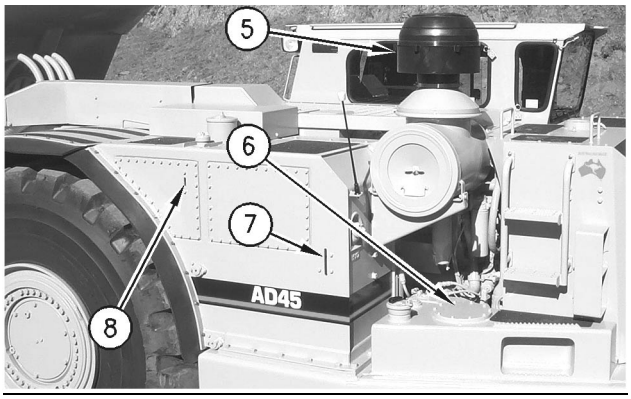

Illustration 316 g00952419

(F) Check engine air precleaner (5) for accumulated debris. If necessary, clean engine air precleaner (5). For the correct procedure, refer to Operation and Maintenance Manual, “Engine Air Precleaner - Clean” for the machine that is being serviced.

(G) Inspect fuel tank (6). Make sure that the filler cap is installed correctly. Check the welds and mounting brackets for the fuel tank. Look for any leaks or damage to the fuel tank.

(H) Inspect the hydraulic systems. Check for leaks, worn hoses and for damaged lines. Repair any leaks, worn hoses and damaged lines.

Check the oil level in hydraulic tank (7). Check the level in steering tank (8). Make sure that the filler caps are installed. Inspect the tank covers for damaged bolts, loose bolts or missing bolts. Tighten loose bolts and replace missing bolts. Check the welds and mounting brackets for the hydraulic tank and the steering tank. Inspect the tank for leaks or for damage. If necessary, make repairs.

(I) Inspect the front suspension cylinders for leaks or damage. Repair any leaks in the suspension cylinders. Check for the following conditions. If any of these conditions are present, refer to Operation and Maintenance Manual, “Suspension Cylinder - Check” for the machine that is being serviced.

- The chrome has been wiped off and the whole length of the chrome is used during normal operation.
- The ride is harsh and the suspension cylinders extend fully when the machine is empty.

(J) Inspect tires for cuts, gouges and proper inflation. Remove large rocks from the treads. Look for abnormal wear or uneven wear that may indicate mechanical problems elsewhere. Make sure that you check the inside of the tire for damage or for wear. Inspect the tire treads for damage. If necessary, repair the tires.

Look for damaged rims. Replace any missing valve caps. Check the wheels for bolts that are loose or missing.

Note: Rust behind a bolt may indicate that the bolt is loose. Shiny metal areas around a bolt may indicate that the bolt is loose.

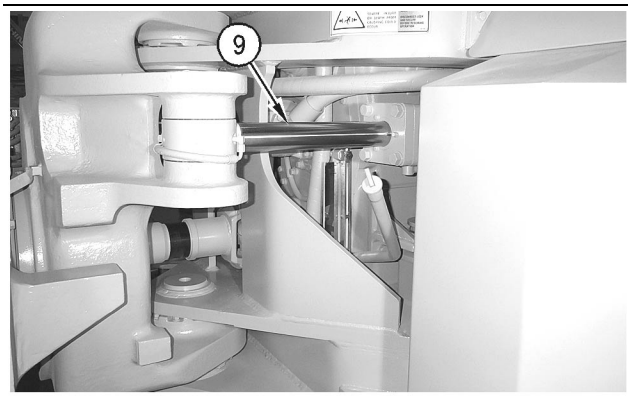

Illustration 317 g00952458

(K) Inspect the steering hydraulic system for leaks, worn hoses and damaged lines. If necessary repair leaks, worn hoses and damaged lines. Inspect steering cylinders (9).

(L) Inspect the rear axle for leaks. Inspect the rear lights for damage.

Illustration 318 g00952460

(M) Inspect the frame and the dump body. Check frame (10) for cracks or damage. Inspect dump body (11) for damage, wear or distortion. Check for uneven wear of the body support pads.

(N) Inspect the articulating hitch and the oscillating hitch for wear, damage, and loose or missing bolts. Have necessary repairs made.

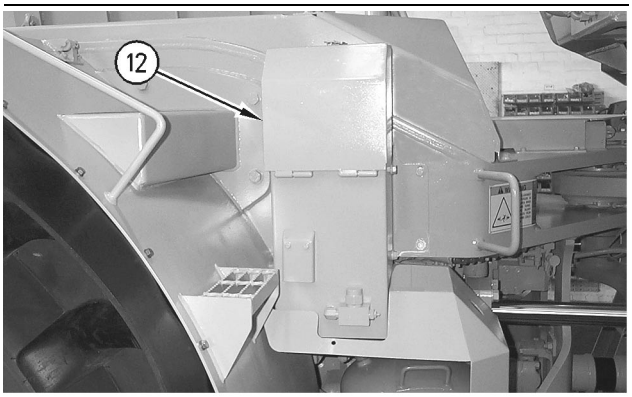

Illustration 319 g00952465

(O) Inspect the automatic lubrication system. Inspect tank (12) for leaks. Fill tank (12) with lubricant. For the correct procedure, refer to the Operation and Maintenance Manual, “Automatic Lubrication System - Fill” for the machine that is being serviced. Check all of the grease fittings.

Illustration 320 g00993186

(P) Inspect Rollover Protective Structure (ROPS) or Falling Object Protective Structure (FOPS) (13) for cracks in welds, castings or any metal section on the ROPS/FOPS. Check the mounting bolts and the mounting pads for damage. Consult your Caterpillar dealer for necessary repairs. Inspect the operator's station. Check the Caterpillar Monitoring System for diagnostic codes. Correct any discrepancies.

AE40 Series II

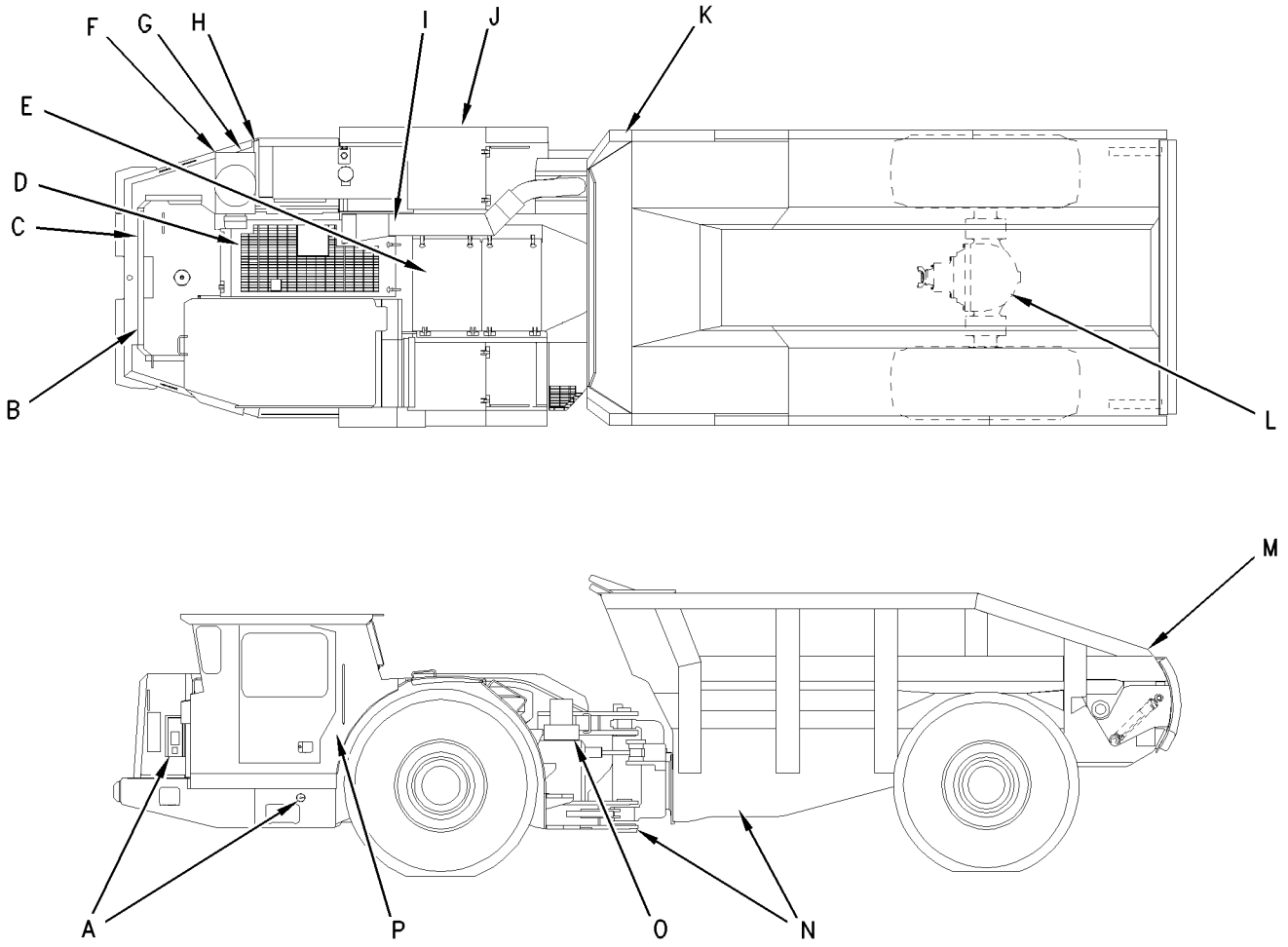

Illustration 321 g00952469

Inspection points for the service inspection

(A) Ground level controls
(B) Front lights
(C) Cooling system
(D) Engine
(E) Power train hydraulic system
(F) Air cleaner
(G) Fuel tank
(H) Hydraulic system
(I) Front suspension cylinders
(J) Tires
(K) Steering hydraulic system
(L) Rear axle
(M) Frame and body
(N) Articulating hitch and oscillating hitch
(O) Automatic lubrication system (if equipped)
(P) Rollover Protective Structure (ROPS) and Falling Object Protective Structure (FOPS)

(A) Inspect the ground level controls for proper operation. Replace a damaged or worn engine shutdown switch (1). Replace a damaged or worn battery disconnect switch (2).

(B) Inspect the lights for broken lamps, lenses and proper operation. Replace broken lamps and lenses.

(C) Inspect the cooling system for leaks, worn hoses and debris. Repair any leaks and damaged hoses. Remove any debris that could block the air flow through the radiator.

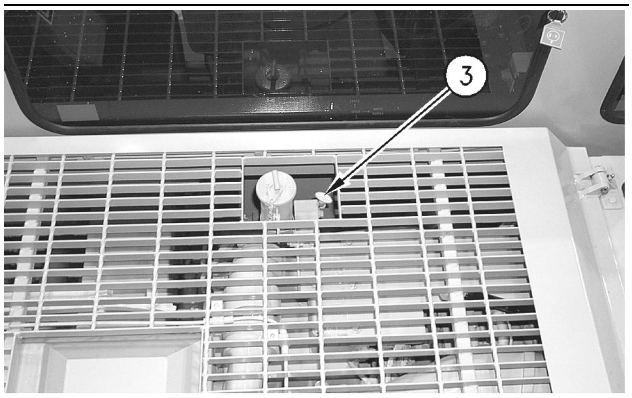

Illustration 322 g00943815

(D) Inspect the engine. Use dipstick (3) to check the engine oil level. Check for oil leaks, coolant leaks, and exhaust leaks. Check the belts of the engine for proper tension and for good condition. Check the level in the washer fluid bottle.

Illustration 323 g00952402

(E) Inspect the hydraulic system for the torque converter and transmission (4). Check for leaks from the torque converter and from the transmission. Check for worn hoses and for damaged lines. Repair any leaks, worn hoses and damaged lines.

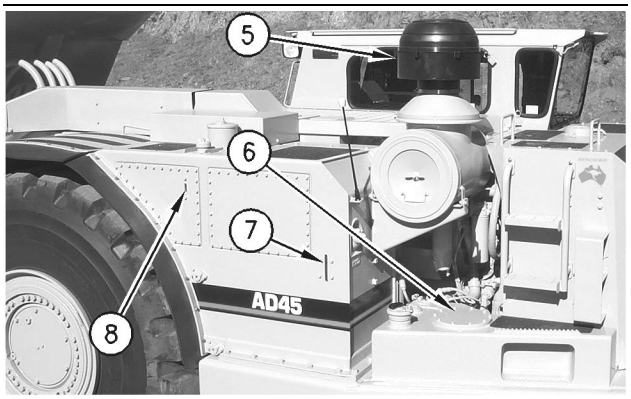

Illustration 324 g00952419

(F) Check engine air precleaner (5) for accumulated debris. If necessary, clean engine air precleaner (5). For the correct procedure, refer to Operation and Maintenance Manual, “Engine Air Precleaner - Clean” for the machine that is being serviced.

(G) Inspect fuel tank (6). Make sure that the filler cap is installed correctly. Check the welds and mounting brackets for the fuel tank. Look for any leaks or damage to the fuel tank.

(H) Inspect the hydraulic systems. Check for leaks, worn hoses and for damaged lines. Repair any leaks, worn hoses and damaged lines.

Check the oil level in hydraulic tank (7). Check the level in steering tank (8). Make sure that the filler caps are installed. Inspect the tank covers for damaged bolts, loose bolts or missing bolts. Tighten loose bolts and replace missing bolts. Check the welds and mounting brackets for the hydraulic tank and the steering tank. Inspect the tank for leaks or for damage. If necessary, make repairs.

(I) Inspect the front suspension cylinders for leaks or damage. Repair any leaks in the suspension cylinders. Check for the following conditions. If any of these conditions are present, refer to Operation and Maintenance Manual, “Suspension Cylinder - Check” for the machine that is being serviced.

- The chrome has been wiped off and the whole length of the chrome is used during normal operation.

- The ride is harsh and the suspension cylinders extend fully when the machine is empty.

(J) Inspect tires for cuts, gouges and proper inflation. Remove large rocks from the treads. Look for abnormal wear or uneven wear that may indicate mechanical problems elsewhere. Make sure that you check the inside of the tire for damage or for wear. Inspect the tire treads for damage. If necessary, repair the tires.

Look for damaged rims. Replace any missing valve caps. Check the wheels for bolts that are loose or missing.

Note: Rust behind a bolt may indicate that the bolt is loose. Shiny metal areas around a bolt may indicate that the bolt is loose.

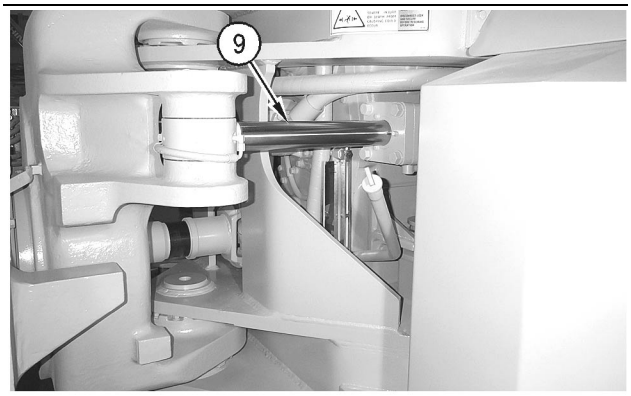

Illustration 325 g00952458

(K) Inspect the steering hydraulic system for leaks, worn hoses and damaged lines. If necessary repair leaks, worn hoses and damaged lines. Inspect steering cylinders (9).

(L) Inspect the rear axle for leaks. Inspect the rear lights for damage.

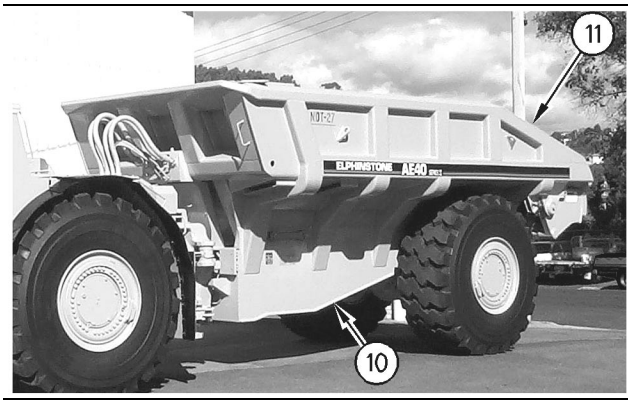

Illustration 326 g00952543

(M) Inspect the frame and the ejector body. Check frame (10) for cracks or damage. Inspect ejector body (11) for damage, wear or distortion. Check for uneven wear of the body support pads.

(N) Inspect the articulating hitch and the oscillating hitch for wear, damage, and loose or missing bolts. Have necessary repairs made.

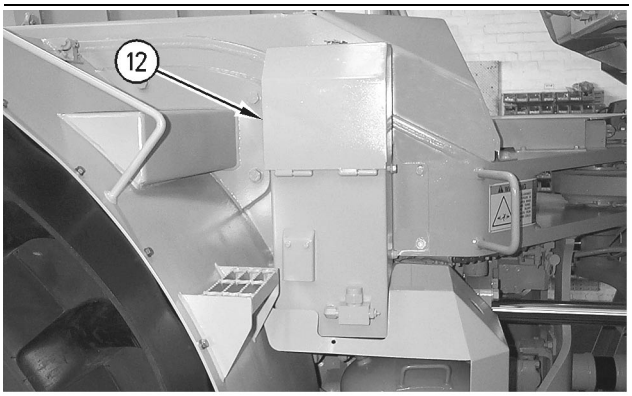

Illustration 327 g00952465

(O) Inspect the automatic lubrication system. Inspect tank (12) for leaks. Fill tank (12) with lubricant. For the correct procedure, refer to the Operation and Maintenance Manual, “Automatic Lubrication System - Fill” for the machine that is being serviced. Check all of the grease fittings.

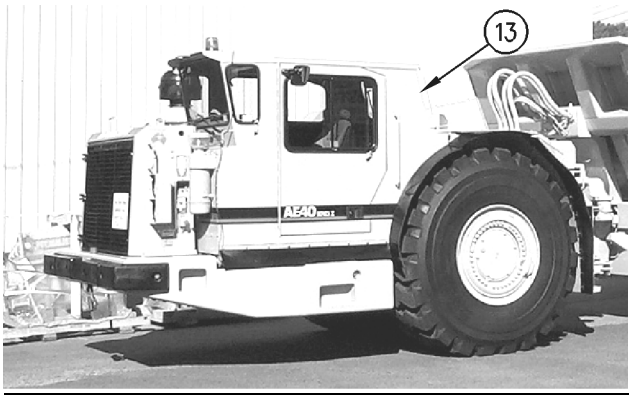

Illustration 328 g00952467

(P) Inspect Rollover Protective Structure (ROPS) or Falling Object Protective Structure (FOPS) (13) for cracks in welds, castings or any metal section on the ROPS/FOPS. Check the mounting bolts and the mounting pads for damage. Consult your Caterpillar dealer for necessary repairs. Inspect the operator’s station. Check the Caterpillar Monitoring System for diagnostic codes. Correct any discrepancies.

i01870669

Steering Cylinder Bearings - Lubricate

SMCS Code: 4303-086-BD

NOTICE
Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Wipe off the fittings before any lubricant is applied.

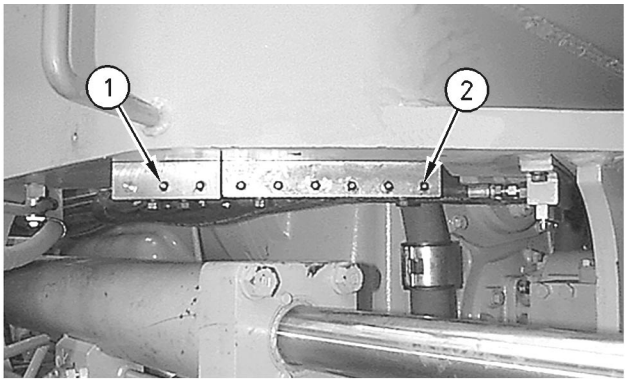

Illustration 329 g00952584

1. Lubricate the right steering cylinder bearing in the head end of the steering cylinder through remote mounted fitting (1).

2. Lubricate the left steering cylinder bearing in the head end of the steering cylinder through remote mounted fitting (2).

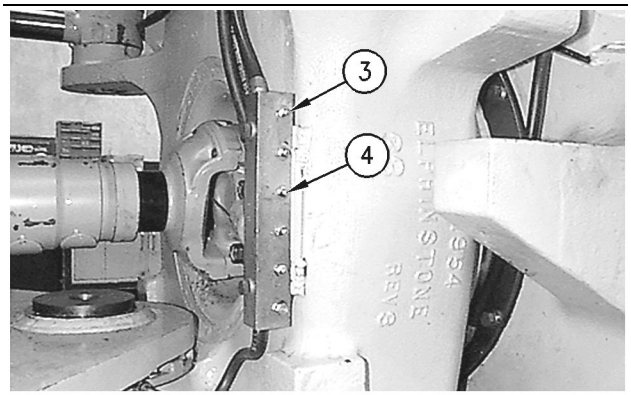

Illustration 330 g00952585

3. Lubricate the left steering cylinder bearing in the rod end of the steering cylinder through remote mounted fitting (3).

4. Lubricate the right steering cylinder bearing in the rod end of the steering cylinder through remote mounted fitting (4).

i01870697

Steering Stop - Check

SMCS Code: 7188-535

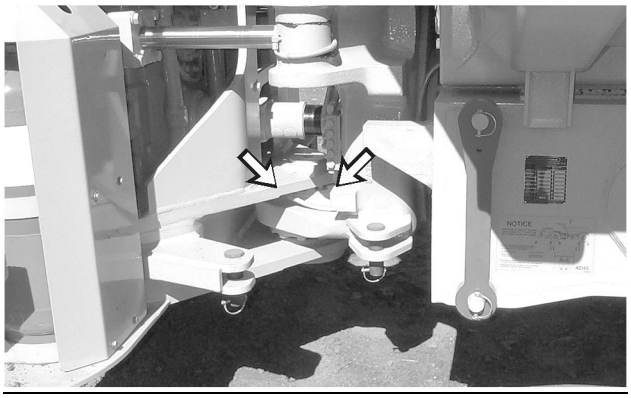

Illustration 331 g00952594

Check the clearance between the front frame and the rear frame steering stops.

Reference: For additional information about the correct procedure, refer to Steering System Systems Operation, Testing and Adjusting , “Steering Neutralizer Valve - Check and Adjust” for the machine that is being serviced.

i01871013

Steering System Oil - Change

SMCS Code: 4332-044

Operate the machine to warm the steering system oil.

The machine must be on level, the parking brake engaged and the engine stopped.

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Remove the steering tank filler cap slowly to relieve any steering tank pressure. Remove the filler cap to prevent a vacuum in the steering tank. Install the filler cap after the tank is drained to prevent dirt from entering the system.

Illustration 332 g00952739

Note: Hand tighten the NPT pipe nipple. Do not use tools.

2. Remove the tank drain plug from the steering tank. Open the drain valve by installing a 1 inch NPT pipe nipple, 88 mm (3.50 inch) long, to open the internal drain valve and drain the oil. Drain the oil into a suitable container.

3. Remove the pipe nipple and install the drain plug.

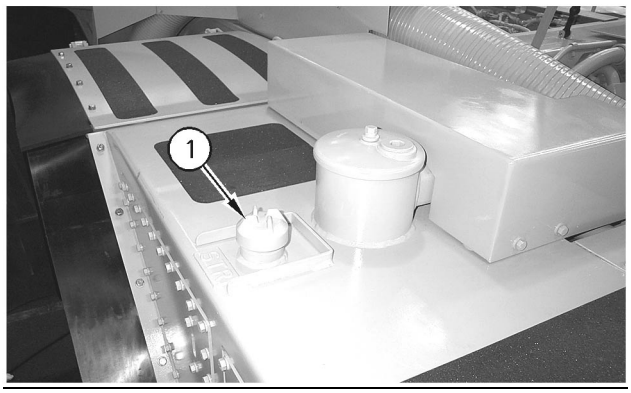

Illustration 333 g00952743

4. Remove filler cap (1).

5. Remove the strainer retaining ring.

6. Remove the strainer. Wash the cap and strainer in clean, nonflammable solvent.

7. Inspect the cap seal. Use a new seal if the seal is damaged.

8. Install the strainer and the retaining ring.

9. Fill the steering tank.

Reference: For information on lubricants and the refill capacity, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

10. Install the filler cap.

11. Start the engine and run at low idle. Check for leaks.

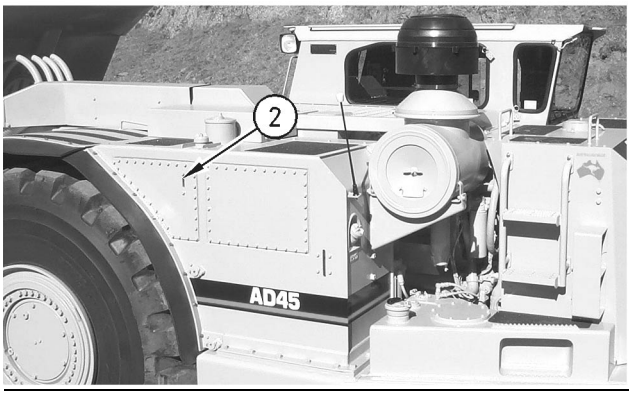

Illustration 334 g00952752

12. Maintain the oil level to the FULL mark in sight gauge (2).

13. Remove the filler cap and add oil, if necessary.

i01871097

Steering System Oil Filter - Replace

SMCS Code: 431F-510; 5068-510

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The machine must be level, the parking brake engaged and the engine stopped.

1. Remove the steering tank filler cap slowly to relieve any steering tank pressure. Install the filler cap.

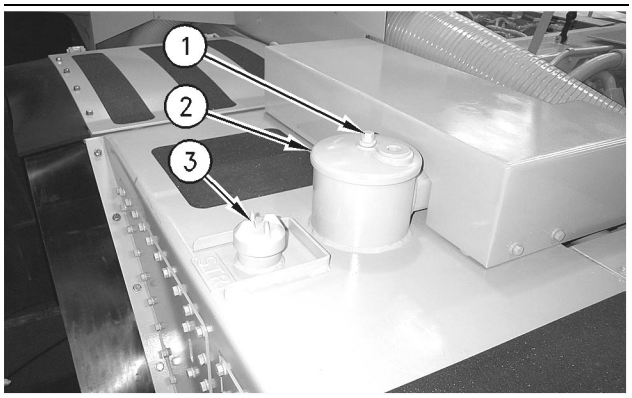

Illustration 335 g00952779

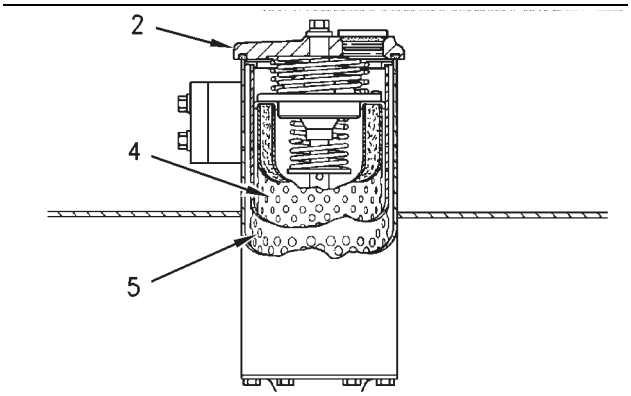

Illustration 336 g00952780

2. Remove bolt (1) and filter cover (2).

3. Remove and discard used filter element (4).

4. Remove screen (5).

5. Clean the cover and screen in clean, nonflammable solvent. Inspect the cover seal. If the seal is damaged, use a new seal.

6. Install the clean screen and the new filter element.

7. Install the cover. Tighten cover bolt (1) to 59 ± 5 N·m (43 ± 4 lb ft).

8. Start the engine and run at low idle. Check for leaks.

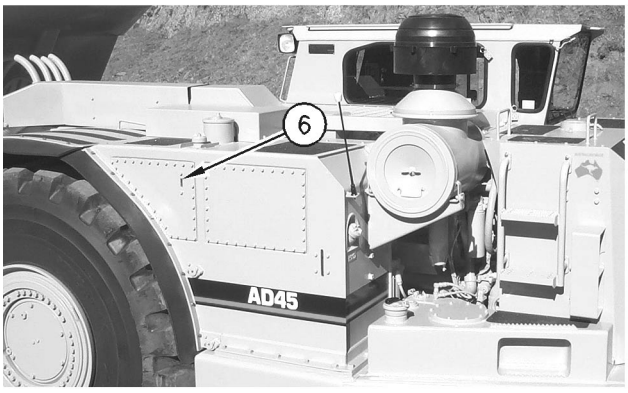

Illustration 337 g00952784

9. Maintain the oil level to the FULL mark in sight gauge (6).

10. Remove filler cap (3) and add oil, if necessary.

i01871099

Steering System Oil Level - Check

SMCS Code: 4332-535-FLV

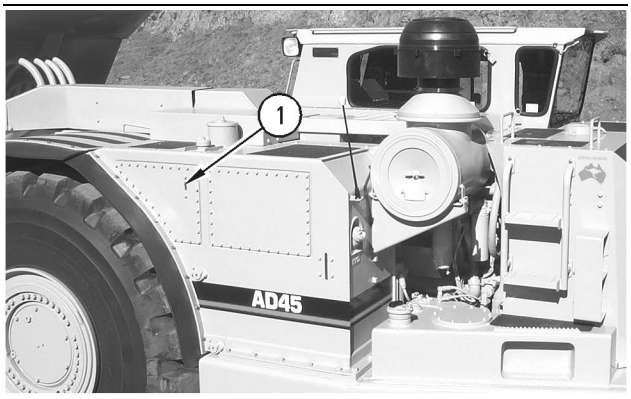

Illustration 338 g00952788

The steering tank is located on the right side of the machine.

1. With the engine running, maintain the oil level to the FULL mark in sight gauge (1).

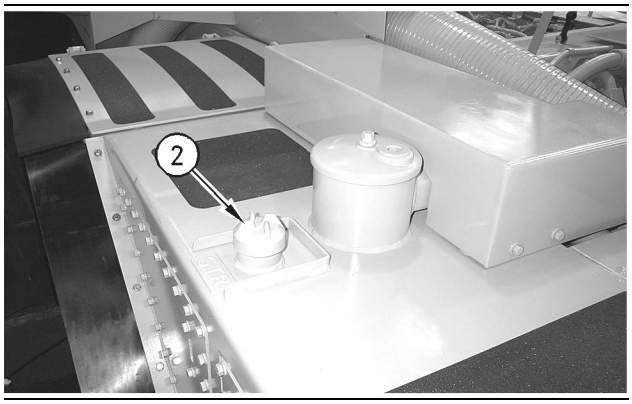

Illustration 339 g00952789

2. Stop the engine.

3. Remove filler cap (2) slowly to relieve any steering tank pressure. Add oil, if necessary.

4. Clean the filler cap and install the filler cap.

i01870723

Steering Tank Screen - Clean

SMCS Code: 4332-070-Z3

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

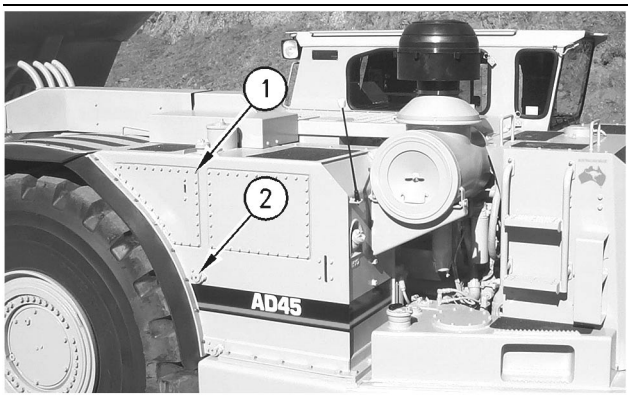

Illustration 340 g00952620

1. Remove the steering tank filler cap slowly to relieve any steering tank pressure. Remove the filler cap to prevent a vacuum in the steering tank. Install the filler cap after the tank is drained to prevent dirt from entering the system.

Note: Hand tighten the NPT pipe nipple. Do not use tools.

2. Remove tank drain plug (2) from the steering tank. Open the drain valve by installing a 1 inch NPT pipe nipple, 88 mm (3.50 inch) long, to open the internal drain valve and drain the oil.

3. Remove bolts (1) from the steering tank cover and remove the cover.

4. Clean the debris from the bottom of the steering tank.

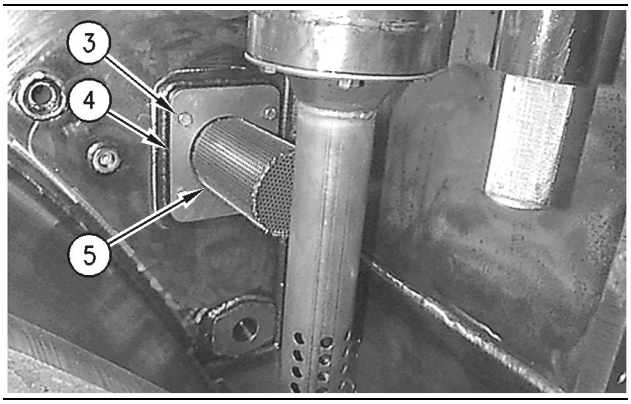

Illustration 341 g00952714

5. Remove four bolts (3), retainer plate (4) and suction screen (5).

6. Wash the screen in clean, nonflammable solvent.

7. Install suction screen (5), retaining plate (4) and mounting bolts (3).

8. Clean the steering tank cover in clean, nonflammable solvent. Inspect the cover gasket. If the gasket is damaged, use a new gasket.

9. Install the steering tank cover and bolts.

10. Fill the steering tank.

    Reference: For information on lubricants and the refill capacity, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

11. Start and run the engine at low idle. Inspect the steering tank for leaks.

12. Maintain the low level to the FULL mark in the sight gauge.

13. Add oil if necessary. Stop the engine.

i01871167

Suspension Cylinder - Check

SMCS Code: 7201-535

Make sure the body is empty. For the AD45 truck lower the dump body. For the AE40 series II truck fully retract the ejector plate.

Stop the machine gradually on a level surface without using the brakes.

Engage the parking brake. Stop the engine.

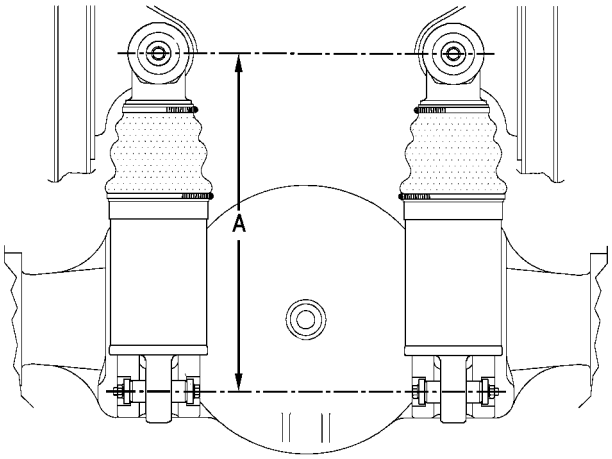

Illustration 342 g00952831

Check the front suspension cylinders against the dimensions from the last time you performed the charging procedure. If you do not have those dimensions, the following dimension can be a guideline.

- Distance (A) of the cylinder from pin to pin should be 882 ± 6 mm (34.7 ± 0.25 inch)

Note: If the height of the front cylinder is not within the acceptable range, perform the charging procedure.

Reference: For the charging procedure, refer to Systems Operation, Testing and Adjusting, “Suspension Cylinders” for the machine that is being serviced.

i01871150

Suspension and Suspension Cylinder Bearings - Lubricate

SMCS Code: 7200-086; 7201-086-BD

NOTICE
Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Wipe all fittings clean before lubricating.

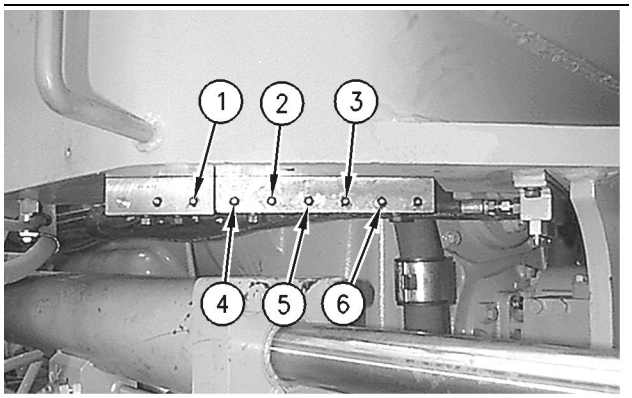

Illustration 343 g00952811

1. Lubricate the right upper suspension cylinder bearing through remote mounted fitting (1).
2. Lubricate the left lower suspension cylinder bearing through remote mounted fitting (2).
3. Lubricate the front suspension frame, left pivot bearing through remote mounted fitting (3).
4. Lubricate the left upper suspension cylinder bearing through remote mounted fitting (4).
5. Lubricate the front suspension frame, right pivot bearing through remote mounted fitting (5).
6. Lubricate the right lower suspension cylinder bearing through remote mounted fitting (6).

i01871223

Tailgate and Tailgate Cylinder Bearings - Lubricate

SMCS Code: 5107-086-BD; 7271-086-BD

NOTICE
Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Wipe all fittings clean before lubricating.

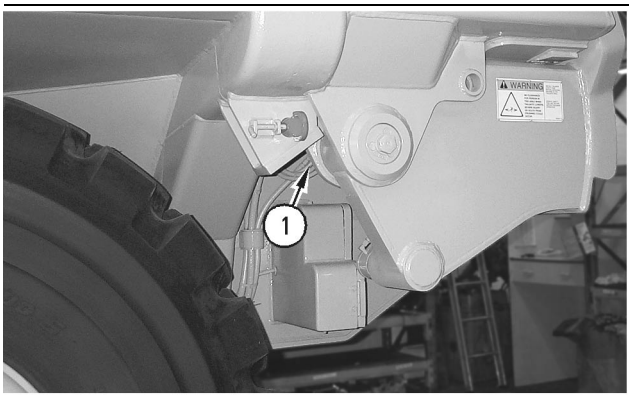

Illustration 344 g00952850

1. Lubricate the tailgate pivot and cylinder bearings through three remote mounted fittings (1) on each side of the machine.

i01871248

Tire Inflation - Check

SMCS Code: 4203-535-AI; 4203-535-PX

Illustration 345 g00952922

Measure the tire pressure on each tire. Consult your Caterpillar dealer for correct load rating and for the correct operating pressures.

Inflate the tires, if necessary.

Reference: For additional information about tire inflation, tire pressures, and tire inflation pressure adjustment, refer to the Operation and Maintenance Manual, “Tire Inflation Information” for the machine that is being serviced.

i01871266

Torque Converter Oil Filter - Replace

SMCS Code: 3004-510

The machine must be level, the parking brake engaged and the engine stopped.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

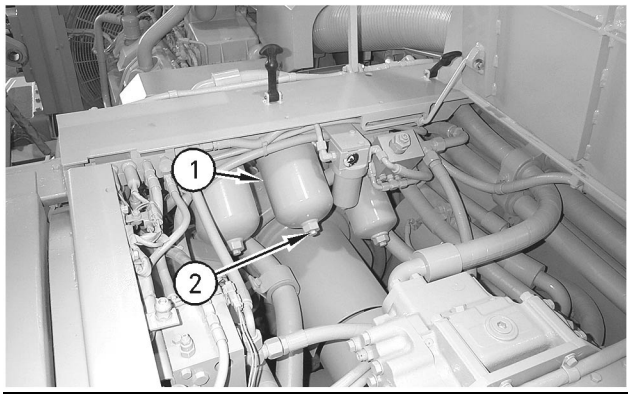

Illustration 346 g00952933

1. Remove drain plug (2) from the bottom of filter housing (1) and drain the oil into a suitable container. Install drain plug (2) in the filter housing and tighten finger tight.

Note: Removing the drain plug from the bottom of the filter housing may not drain all the oil from the filter housing. Avoid spillage when removing the filter housing and filter element.

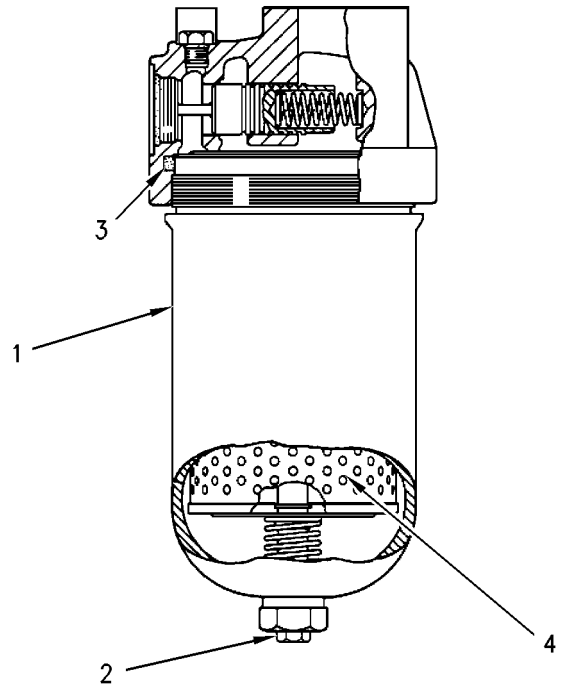

Illustration 347 g00952934

2. Remove filter housing (1) and element (4). Discard the used element.

3. Remove drain plug (2) from the filter housing. Wash the drain plug and filter housing in clean, nonflammable solvent. Install the filter housing drain plug.

4. Inspect seal (3) in the filter base. If the seal is damaged, replace it with a new seal.

5. Install the new element in the filter housing. Install the filter housing and element.

6. Start the engine and run the engine at low idle. Check for leaks.

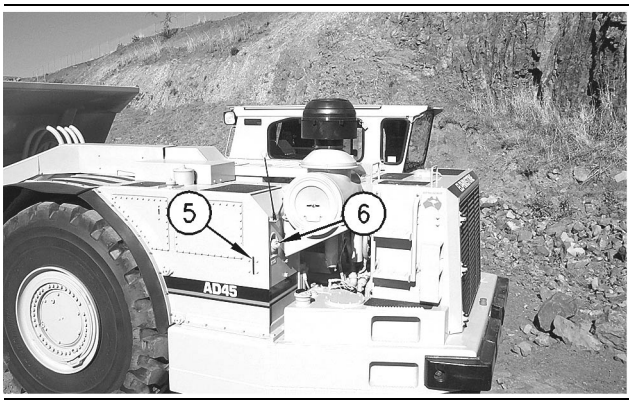

Illustration 348 g00952935

7. With the oil cold, check the oil level in sight gauge (5). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

8. Maintain the oil level to the FULL mark in the sight gauge.

9. Remove filler cap (6) and add oil if necessary.

i01871346

Torque Converter Sump Screen - Clean

SMCS Code: 3101-070-Z3

Clean the screen whenever there is a failure of the torque converter.

The machine must be level, the parking brake engaged and the engine stopped.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

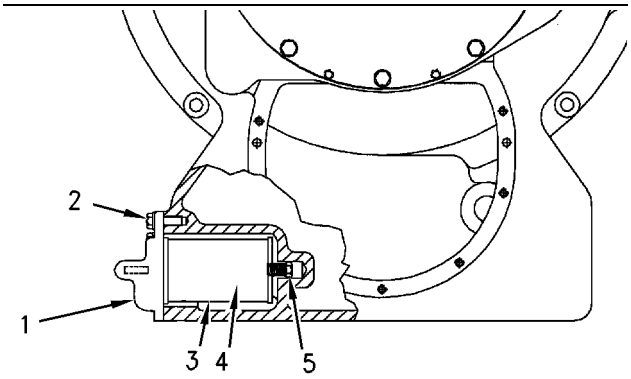

Illustration 349 g00952990

Note: Approximately 15 L (4 US gal) of oil will drain when cover assembly (1) is removed.

1. Remove bolts (2) from cover assembly (1). Remove the cover assembly. Drain the oil into a suitable container.

2. Remove the screen and baffle retaining nut (5).

3. Remove baffle (3) and screen (4) from the cover.

4. Wash the screen, baffle and cover in clean, nonflammable solvent. Do not crush the screen.

5. Inspect the cover gasket for damage. If damaged, use a new gasket.

6. Assemble the screen and baffle on the cover. Install the cover assembly.

7. Start the engine and run the engine at low idle. Inspect for leaks.

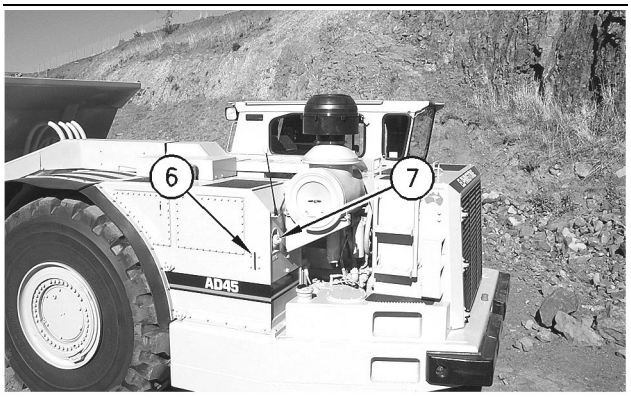

Illustration 350 g00952994

8. With the oil cold, check the oil level in sight gauge (6). For the AD45 truck check the oil level with the body fully lowered. For the AE40 Series II truck check the oil level with the ejector plate fully retracted and the tailgate fully raised.

9. Maintain the oil level to the FULL mark in the sight gauge.

10. Remove filler cap (7) and add oil if necessary.

i01871355

Transmission Breather - Clean

SMCS Code: 3030-070-BRE

Illustration 351 g00953029

1. Remove the transmission breather from the transmission cover.

2. Wash the breather in clean, nonflammable solvent.

3. Allow the breather to dry.

4. Install the clean transmission breather.

i01871361

Transmission Magnetic Screen - Clean

SMCS Code: 3030-070-MGS

The machine must be level, the parking brake engaged and the engine stopped.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

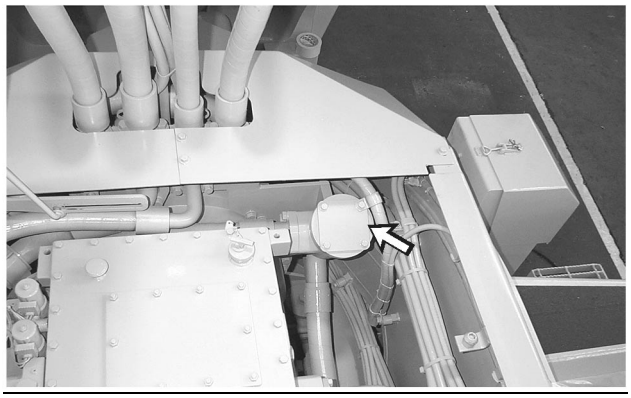

Illustration 352 g00953038

1. Remove the magnetic screen cover and the wave washer assembly.

2. Remove the screen, magnet and tube assembly from the housing.

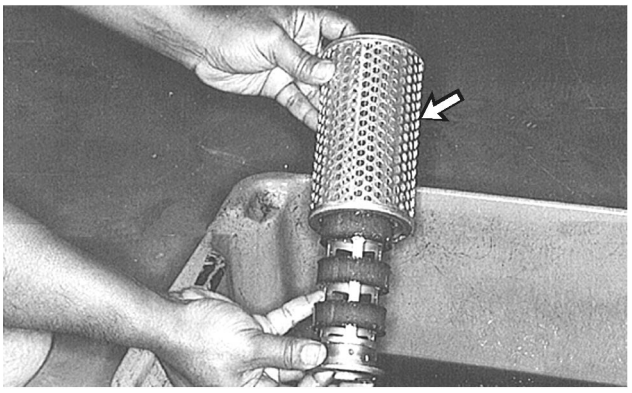

Illustration 353 g00953041

3. Wash the magnet, screen and tube assembly in clean, nonflammable solvent. Clean the magnets with a cloth, a stiff bristle brush or pressure air.

NOTICE
Do not drop or rap the magnets against any hard objects. Replace any damaged magnets.

4. Clean the cover and inspect the seal. Replace the seal if it is damaged.

5. Install the clean screen, magnet and tube assembly with the magnet opening down.

6. Install the cover. Tighten the cover bolts.

7. Fill the transmission with oil.

   Reference: Refer to Operation and Maintenance Manual, “Transmission Oil Level - Check” for the machine that is being serviced.

i01871482

Transmission Oil - Change

SMCS Code: 3030-044

1. Operate the machine to warm the transmission oil.

2. Park the machine on a level surface. Engage the parking brake. Stop the engine.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

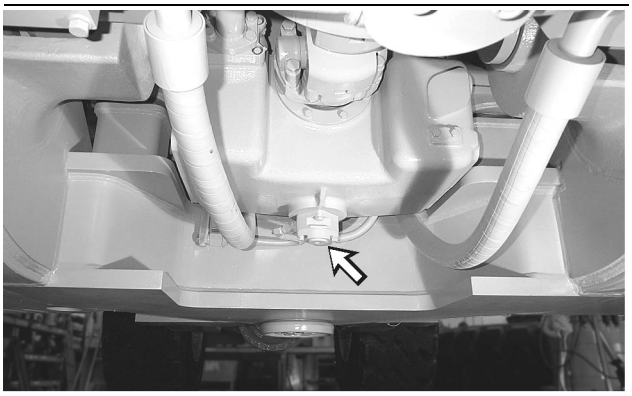

Illustration 354 g00953064

Note: Hand tighten the NPT pipe nipple. Do not use tools.

3. Remove the transmission drain plug. Open the drain valve by installing a 1 inch NPT pipe nipple, 88 mm (3.5 inch) long, in the bottom of the transmission, to open the internal drain valve. Drain the oil into a suitable container.

4. Remove the pipe nipple. Clean the drain plug and install the transmission drain plug.

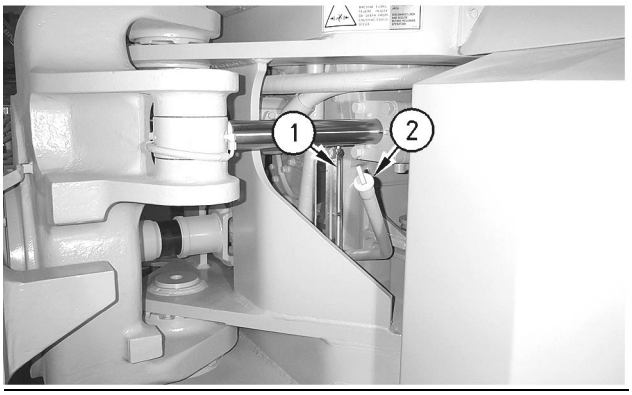

Illustration 355 g00953092

5. Remove filler cap (2). Fill the transmission with oil through the filler tube. Clean the filler cap and install the filler cap.

   Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricants Viscosities and Refill Capacities” for the machine that is being serviced.

6. Start and run the engine at low idle. Inspect the machine for leaks.

7. Operate the transmission control to circulate oil in the transmission.

8. Maintain the oil level to the FULL mark on sight gauge (1). Add oil, if necessary.

9. Stop the engine.

i01871600

Transmission Oil Filter - Replace

SMCS Code: 3067-510

1. Park the machine on a level surface. Engage the parking brake. Stop the engine.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

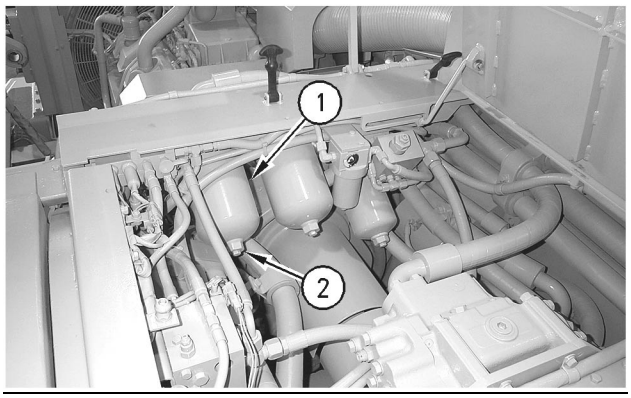

Illustration 356 g00953154

2. Remove drain plug (2) from the bottom of filter housing (1) and drain the into a suitable container. Install drain plug (2) in the filter housing and tighten finger tight.

Note: Removing the drain plug from the bottom of the filter housing may not drain all the oil from the filter housing. Avoid spillage when removing the filter housing and filter element.

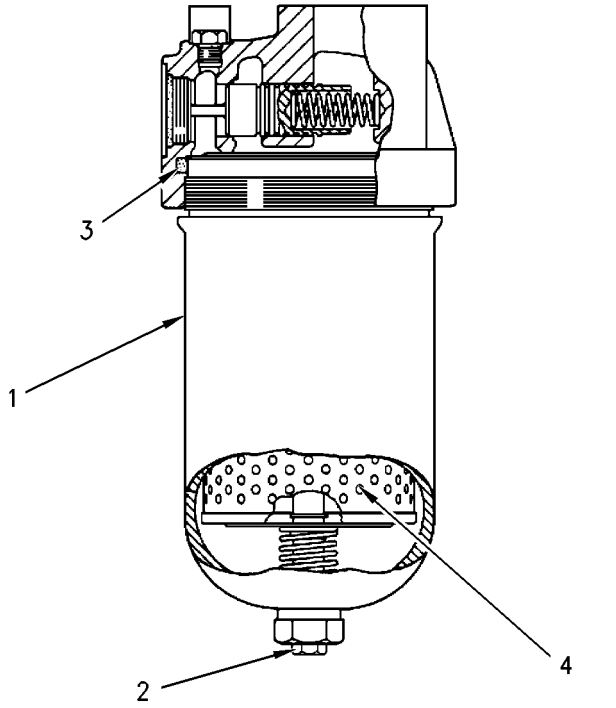

Illustration 357 g00953160

3. Remove filter housing (1) and element (4). Dispose of the used filter element.

4. Remove drain plug (2) from the filter housing. Wash the drain plug and filter housing in clean, nonflammable solvent. Install the filter housing drain plug.

5. Inspect seal (3) in the filter base. If the seal is damaged, replace the seal with a new seal.

6. Install a new filter element in filter housing. Install the filter housing and element.

7. Start and run the engine at low idle. Inspect for leaks.

8. Operate the transmission control to circulate oil in the transmission.

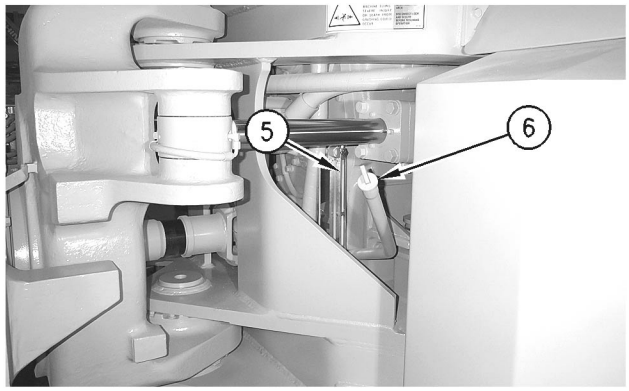

Illustration 358 g00953168

9. Maintain the oil level to the FULL mark on sight gauge (5). Remove filler cap (6) and add oil, if necessary.

Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

10. Stop the engine.

i01871603

Transmission Oil Level - Check

SMCS Code: 3030-535-FLV

The transmission oil filler tube and sight gauge are located on the right side of the machine near the articulating hitch.

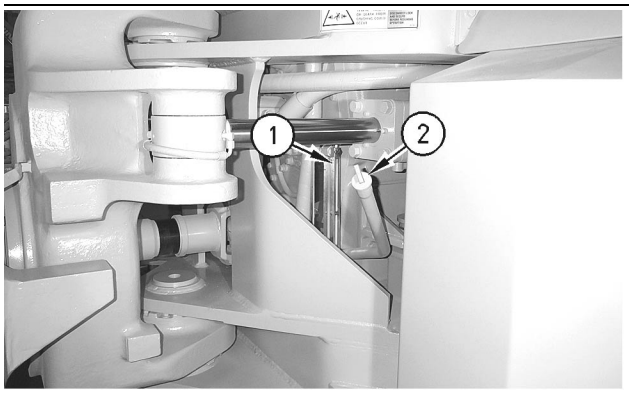

Illustration 359 g00953216

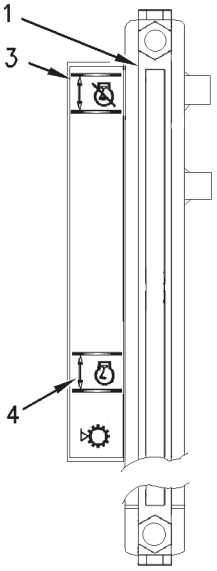

Illustration 360 g00953217

(3) FULL mark when engine is stopped
(4) FULL mark when engine is running

Check the transmission oil level with the machine on a level surface and the parking brake engaged.

1. While the engine is running, maintain the oil level to FULL mark (4) in sight gauge (1). When the engine is stopped, maintain the oil to FULL mark (3) in sight gauge (1).

2. If necessary, remove oil filler cap (2) and add oil. Clean the filler cap and install the filler cap.

Reference: For information on lubricants and refill capacities, refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the machine that is being serviced.

i01871783

Turbocharger - Inspect

SMCS Code: 1052-040

If the turbocharger fails during engine operation, severe damage to the turbocharger compressor wheel can result. If the turbocharger fails during engine operation, severe damage to the engine can also result.

For example, damage to the turbocharger compressor wheel could cause parts from the turbocharger compressor wheel to enter the engine cylinder. These parts from the compressor wheel can cause additional damage to the following engine components: pistons, intake valves, exhaust valves and cylinder head.

Note: Turbocharger failure can cause large quantities of oil to enter the intake and exhaust systems. Loss of engine lubricant can result in serious engine damage

If no turbocharger bearing failure has occurred, minor leakage of a turbocharger housing during an extended period of operation at low idle will not cause problems.

Do not continue to operate the engine when a turbocharger bearing failure is accompanied by a significant loss of engine performance. One of the following characteristics will be present with a loss of engine performance;

- Engine smoke.
- Speeding up of the engine with no load.

Note: For specifications used to check the turbocharger, refer to Specifications, “3408E HEUI Engine” for the machine that is being serviced.

i01871868

Wheel Bolt Torque - Check

SMCS Code: 4210-535

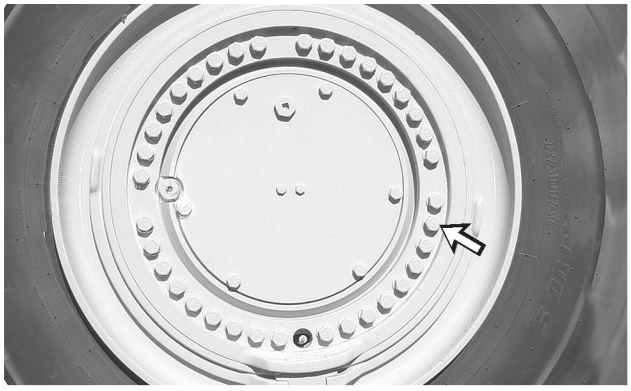

Illustration 361 g00953329

Check the wheel bolt torque at each wheel. Continue to check the torque on new wheels and rebuilt wheels. Check the torque until the torque remains at the specified amount.

Reference: For the correct wheel bolt torque, refer to Power Train, Specifications, “Final Drive, Brake and Wheel” for the machine that is being serviced.

i01871904

Window - Clean

SMCS Code: 7310-070; 7340-070

Illustration 362 g00953351

Use commercially available window cleaning solutions to clean the windows. Only clean the outside windows from the ground unless handholds are available. Use a mop or use a similar device with a long handle to clean the windows from the ground.

i01871882

Window Washer Bottle - Fill

SMCS Code: 7306-544-KE

NOTICE
When operating in freezing temperatures, use Caterpillar nonfreezing window washer solvent or equivalent. System damage can result from freezing.

Illustration 363 g00953340

The window washer reservoir is located at the rear of the operator station. Remove the cap and fill the window washer reservoirs. Refit the cap.

i01871895

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-070

Illustration 364 g00953347

Inspect the condition of the wiper blades on the front and rear windows. Replace the wiper blades if the wiper blades are worn or damaged. If the wiper blades streak the window, replace the wiper blades.